

# **Rule R317-4. Onsite Wastewater Systems.**

## **DRAFT 23**

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## ***R317-4-1. Authority, Purpose, Scope, and Administrative Requirements.***

### **1.1. Authorization.**

These rules are administered by the Division authorized by Title 19 Chapter 5.

### **1.2. Purpose.**

The purpose of this rule is to protect the public health and environment from potential adverse effects from onsite wastewater disposal within the boundaries of the State of Utah.

### **1.3. Scope.**

This rule shall apply to onsite wastewater systems.

### **1.4. Jurisdiction.**

Local Health Departments have jurisdiction to administer this rule. Nothing contained in this rule shall be construed to prevent local health departments from:

- A. adopting stricter requirements than those contained herein;
- B. issuing an operating permit at a frequency not exceeding once every five years with an inspection showing a satisfactory performance of the permitted system by the department's staff before renewal;
- C. taking necessary steps for ground water quality protection through adoption of a ground water quality protection management policy based on a ground water management study, or an onsite wastewater systems management planning policy and land use planning through the county's agency;

**D. prohibiting any alternative system within its jurisdiction;**

E. assessing fees for administration of this rule;

F. requiring the conventional and alternative systems in its jurisdiction be placed under an umbrella of a:

- 1. responsible management entity overseen by the local health department; or,
- 2. contract service provider overseen by the local health department; or
- 3. management district body politic created by the county for the purpose of operation, maintenance, repairs and monitoring of alternative or all onsite wastewater systems.

G. Requiring conventional and alternative systems to be serviced.

### **1.5. Alternative System Administration.**

The local health department having jurisdiction shall obtain approval from the Division to administer the alternative systems program, as outlined in this section, before permitting alternative systems.

A. The local health department request for approval shall include:

- 1. A description of its plan to properly manage these systems to protect public health. This plan shall include:
  - a. A description of review, inspection, and monitoring procedures of these systems;
  - b. Resolutions of the Local Board of Health and the County Commission supporting this request;
  - c. Adoption of an ordinance or regulation covering:
    - i. Permitting;
    - ii. Management;
    - iii. Servicing; and,
    - iv. Enforcement of these alternative systems.
  - d. A description of the technical capability and training plans of the staff, and availability of resources to adequately manage the increased work load;
  - e. A statement from the county attorney of the county's legal authority to implement and enforce correction of malfunctioning systems and its commitment to exercise this authority; and,
  - f. Description of Management options to be followed.

**Comment [G1]:** Delete. This is akin to allowing locals to prohibit pumps, requiring all water transport against gravity within their jurisdiction to be accomplished by pack mule. If the State is serious about regulating septic systems, they absolutely must take the bull by the horns here. If all water in Utah is owned by the State, then the State must use all reasonably available means to protect this perishable resource. By leaving this clause in place, you are allowing locals (who in many cases having no training on the subject) to decide how much wastewater treatment is appropriate to protect groundwater they do not own.

Do not use this clause as a means of allowing locals to control land development. Local control of land development should be accomplished through zoning at the local level.

2. An agreement to:

- a. Advise the owner of the type of alternative system, and information concerning risk of failure, level of maintenance required, financial liability for repair, modification or replacement of a failed system and periodic monitoring requirements;
- b. Ensure the existence of the alternative system is recorded on the deed of ownership for that property;
- c. Provide oversight of installed alternative systems;
- d. Inspect all installed alternative systems at frequency specified in this rule, through:
  - i. The department's staff;
  - ii. Contracted service providers;
  - iii. Responsible management entities;
  - iv. A management district body politic created by the county for the purpose of managing onsite wastewater systems; or,
  - v. Any combination of the above options.
- e. Maintain records of all installed alternative systems, failures, modifications, repairs and all inspections recording the condition of the system at the time of inspection such as, but not limited to, overflow, surfacing, ponding, and nuisance.
- f. Submit an annual report on or before September 1 for the previous State of Utah fiscal year's activities, to the Division showing:
  - i. Type and number of alternative systems approved, installed, modified, repaired, failed, inspected;
  - ii. A summary of enforcement actions taken, pending and resolved;
  - iii. A summary of performance of water quality data collected;

B. All alternative systems will be inspected and serviced as detailed in Table 7 and Section R317-4-11:

### ***R317-4-2. Definitions.***

- 2.1. "Absorption area" means the entire area used for the subsurface ~~treatment and~~ dispersion of effluent ~~by an absorption system.~~
- 2.2. "Absorption bed" means an absorption system consisting of large excavated areas utilizing drain media or chambers.
- 2.3. "Absorption system" means a covered drainage system constructed to receive and to disperse effluent, from gravity or a pump, in such a manner that the effluent is effectively filtered and retained below the ground surface.
- 2.4. "Absorption trench" means an absorption system consisting of ~~a series of narrow~~ a(n) excavated trench(es) utilizing drain media, chambers, or bundled synthetic aggregate units.
- 2.5. "Alternative onsite wastewater system" means an onsite wastewater system that ~~is not a conventional onsite wastewater system.~~ utilizes alternative means or methods of treating and disposing of septic effluent
- 2.6. "At-Grade system" means an alternative onsite wastewater system where the bottom of the absorption system is placed at or below the elevation of the existing site grade, and the top of the distribution pipe is above the elevation of existing site grade, and the absorption system is contained within fill that extends above that grade.
- 2.7. "Barrier material" means an effective, pervious material such as an acceptable synthetic filter fabric, or a two-inch layer of compacted straw.
- 2.8. "Bedrock" means the rock, usually solid, that underlies soil or other unconsolidated, superficial material.
- 2.9. "Bedroom" means any portion of a dwelling which is so designed as to furnish the minimum isolation necessary for use as a sleeping area. It may include, but is not limited to, a den, study, sewing room, sleeping loft, or enclosed porch. Unfinished basements shall be counted as a minimum of one additional bedroom.

**Comment [G2]:** Delete. This is a conflict of interest.

- 2.10. "Board" means the Utah Water Quality Board.
- 2.11. "Body politic" means the State or its agencies or any political subdivision of the State to include a county, city, town, improvement district, taxing district or other governmental subdivision or public corporation of the State.
- 2.12. "Building sewer" means the pipe which carries wastewater from the building to ~~a public sewer~~, an onsite wastewater system or other point of dispersal. It is synonymous with "house sewer".
- 2.13. "Bundled synthetic aggregate trench" means an absorption trench utilizing bundled synthetic aggregate units.
- 2.14. "Bundled synthetic aggregate unit" means a cylindrically shaped manufactured unit of synthetic aggregate enclosed in polyolefin netting, which may contain a perforated pipe.
- 2.15. "Chamber" means an open bottom, chambered structure of an approved material and design.
- 2.16. "Chambered trench" means an absorption trench utilizing chambers.
- 2.17. "Cleanout" means a device designed to provide access for removal of deposited or accumulated materials, generally from a pipe.
- 2.18. "Closed loop distribution" means a distribution method where the absorption system layout has ~~the inlet and outlet ends of~~ each lateral connected creating a complete and continuous pathway for effluent flow.
- 2.19. "Coarse drain media" means drain media ranging from ¾ to 12 inches in diameter.
- 2.20. "Condominium" means the ownership of a single unit in a multi-unit project together with an undivided interest in common, in the common areas and facilities of the property.
- 2.21. "Connecting trench" means an absorption trench that is used to connect other absorption trenches, is less than 20 feet in length, and may be used to calculate total required absorption area.
- 2.22. "Construction permit" means the permit that authorizes an onsite wastewater system to be installed according to an approved design. This permit shall also authorize activities associated with the repair or alteration of a malfunctioning or failing system.
- 2.23. "Conventional onsite wastewater system" means an onsite wastewater system which consists of a building sewer, a septic tank, and an absorption system utilizing absorption trenches, absorption beds, deep wall trenches, or seepage pits.
- 2.24. "Cover" means soils used to overlay the absorption area which is free of large stones 10 inches diameter or larger, frozen clumps of earth, masonry, stumps, or waste construction material, or other materials that could damage the system.
- 2.25. "Curtain drain" means any ground water interceptor or drainage system that is backfilled with gravel or other suitable material and is intended to interrupt or divert the course of shallow ground water or surface water away from the onsite wastewater system.
- 2.26. "Designer" means a person who fulfills the requirements of Rule R317-11. ~~And is not the regulatory authority.~~
- 2.27. "Deep wall trench" means an absorption system consisting of deep excavated trenches utilizing coarse drain media, with a minimum sidewall absorption depth of 24 inches of suitable soil formation below the distribution pipe.
- 2.28. "Distribution box" means a watertight ~~and corrosion resistant~~ structure which receives effluent and distributes it concurrently, in essentially equal portions, into two or more pipes leading to an absorption system.
- 2.29. "Distribution pipe" means an approved pipe, solid or perforated, used in the dispersion of effluent in an absorption system.
- 2.30. "Diversion valve" means a watertight structure that receives effluent through one inlet and distributes it to two or more outlets, only one of which is used at a time.
- 2.31. "Division" means the Utah Division of Water Quality.

- 2.32. "Domestic wastewater" means a combination of the liquid or water-carried wastes from residences, business buildings, institutions, and other establishments with installed plumbing facilities, excluding non-domestic wastewater. It is synonymous with the term "sewage".
- 2.33. "Drain media" means media used in an absorption system. It shall consist of stone, crushed stone, or gravel, ranging from 3/4 to 2 1/2 inches in diameter. It shall be free from fines, dust, sand or organic material and shall be durable and inert so that it will maintain its integrity, will not collapse or disintegrate with time. The maximum fines in the media shall be 2 percent by weight passing through a US Standard #10 mesh (2 millimeter) sieve. It shall be protected by a barrier material.
- 2.34. "Drainage system" means all the piping within public or private premises, which conveys sewage or other liquid wastes to a legal point of treatment and dispersal, but does not include the mains of a public sewer system or a public sewage treatment or disposal plant.
- 2.35. "Drop box" means a watertight [and corrosion resistant](#) structure which receives septic tank effluent and distributes it into one or more distribution pipes, and into an overflow leading to another drop box and absorption system located at a lower elevation.
- 2.36. "Dry wash" means the dry bed of an ephemeral stream that flows only after heavy rains and is often found at the bottom of a canyon.
- 2.37. "Dwelling" means any structure, building, or any portion thereof which is used, intended, or designed to be occupied for human living purposes including, but not limited to, houses, mobile homes, hotels, motels, and apartments.
- 2.38. "Effluent" means the liquid discharge from any treatment unit including a septic tank.
- 2.39. "Effluent pump" means a pump used to lift effluent.
- 2.40. "Effluent sewer" means solid pipe which carries effluent to the absorption system.
- 2.41. "Ejector pump" means a device to elevate or pump sewage to a septic tank, public sewer, or other means of disposal.
- 2.42. "Ephemeral stream" means a stream that flows for a small period of time (week or less) after a precipitation event.
- 2.43. "Experimental onsite wastewater system" means an onsite wastewater treatment and absorption system which is still in experimental use and requires further testing in order to provide sufficient information to determine its acceptance.
- 2.44. "Filter fabric" means a synthetic, non-degradable woven or spun-bonded sheet material that has adequate tensile strength to prevent ripping during installation and backfilling, adequate permeability to allow free passage of water and gases; and adequate particle retention to prevent downward migration of soil particles into the absorption system. The minimum physical properties for the fabric shall be 4.0 ounces/square yard or equivalent.
- 2.45. "Ground water" means that portion of subsurface water that is in the zone of soil saturation.
- 2.46. "Ground water table" means the surface of a body of unconfined ground water in which the pressure is equal to that of the atmosphere.
- 2.47. "Ground water table, perched" means unconfined ground water separated from an underlying body of ground water by an unsaturated zone. Its water table is a perched water table. It is underlain by a restrictive strata or impervious layer. Perched ground water may be either permanent, where recharge is frequent enough to maintain a saturated zone above the perching bed, or temporary, where intermittent recharge is not great or frequent enough to prevent the perched water from disappearing from time to time as a result of drainage over the edge of or through the perching bed.
- 2.48. "Gulch" means a small rocky ravine or a narrow gorge, especially one with an ephemeral stream running through it.
- 2.49. "Gully" means a channel or small valley, especially one carved out by persistent heavy rainfall or an ephemeral stream.
- 2.50. "Impervious strata" means a layer which prevents water or root penetration. In addition, it shall be defined as unsuitable soils or soils having a percolation rate slower than 60 minutes per inch.

- 2.51. "Installer" means a qualified person with an appropriate contractor's license and knowledgeable in the installation or repair of an onsite wastewater system or its components.
- 2.52. "Intermittent stream" means a stream that flows for a period longer than an ephemeral stream on a seasonal basis or after a precipitation event.
- 2.53. "Invert" means the lowest portion of the internal cross section of a pipe or fitting.
- 2.54. "Lateral" means a length of ~~distribution pipe in trench in~~ the absorption system.
- 2.55. "Local health department" means a county or multi-county local health department established under Title 26A.
- 2.56. "Lot" means a portion of a subdivision, or any other parcel of land intended as a unit for transfer of ownership or for development or both and may not include any part of the right-of-way of a street or road.
- 2.57. "Malfunctioning or failing system" means an onsite wastewater system which is not functioning in compliance with the requirements of this regulation and includes, but is not limited to, the following:
- A. Absorption systems which seep or flow to the surface of the ground or into waters of the state;
  - B. Systems which have overflow from any of their components;
  - C. Systems which, due to failure to operate in accordance with their designed operation, cause backflow into any portion of a building drainage system;
  - D. Systems discharging effluent which does not comply with applicable effluent discharge standards;
  - E. Leaking septic tanks;
  - F. Noncompliance with standards stipulated on or by the construction and/or operating permit.
- 2.58. "Maximum ground water table" means the highest elevation that the top of the "ground water table" or "ground water table, perched" is expected to reach for any reason over the full operating life of the onsite wastewater system at that site.
- 2.59. "May" means discretionary, permissive, or allowed.
- 2.60. "Mound system" means an alternative onsite wastewater system where the bottom of the absorption system is placed above the elevation of the original site, and the absorption system is contained in a mounded fill body above that grade.
- 2.61. "Non-Closed loop distribution" means a distribution method where the absorption system layout has lateral ~~ends that terminate, that are not connected.~~
- 2.62. "Non-Domestic effluent" means the liquid discharge from any treatment unit including a septic tank that has a BOD<sub>5</sub> equal or greater than 250 mg/L; or TSS equal to or greater than 145 mg/L; or fats, oils, and grease equal to or greater than 25 mg/L.
- 2.63. "Non-domestic wastewater" means process wastewater originating from the manufacture of specific products. Such wastewater is usually more concentrated, more variable in content and rate, and requires more extensive or different treatment than domestic wastewater.
- 2.64. "Non-public water source" means a culinary water source that is not defined as a public water source.
- 2.65. "Non-residential" means a building that produces domestic wastewater, and is not a single family dwelling.
- 2.66. "Onsite wastewater system" means an underground wastewater dispersal system that is designed for a capacity of 5,000 gallons per day or less, and is not designed to serve multiple dwelling units which are owned by separate owners except condominiums. It usually consists of a building sewer, a septic tank and an absorption system.
- 2.67. "Operating permit" means the permit that authorizes the operation and maintenance of an onsite wastewater system or wastewater holding tank. It may have a fee component that requires periodic renewal.
- 2.68. "Packed bed media system" means an alternative onsite wastewater system that uses natural or synthetic media to treat wastewater. Biological treatment is facilitated via microbial growth on the surface of the media. The system may include a pump tank, a recirculation tank, or both.
- 2.69. "Percolation rate" means the time expressed in minutes per inch required for water to seep into saturated soil at a constant rate during a percolation test.

- 2.70. "Percolation test" means the method used to measure the permeability of the soil by measuring the percolation rate as described in these rules. This is sometimes referred to as a 'perc test'.
- 2.71. "Permeability" means the rate at which a soil transmits water when saturated.
- 2.72. "Person" means an individual, trust, firm, estate, company, corporation, partnership, association, state, state or federal agency or entity, municipality, commission, or political subdivision of a state (Section 19-1-103).
- 2.73. "Pollution" means any man-made or man-induced alteration of the chemical, physical, biological, or radiological integrity of any waters of the state, unless the alteration is necessary for public health and safety (Section 19-5-102).
- 2.74. "Pressure distribution" means the distribution of effluent under pressure.
- 2.75. "Pressurized absorption system" means an alternative onsite wastewater system designed to uniformly distribute effluent under pressure within the absorption system.
- 2.76. "Pretreatment" means a process which alters non-domestic wastewater and does not discharge non-domestic effluent.
- 2.77. "Public health hazard" means, for the purpose of this rule, a condition whereby there are sufficient types and amounts of biological, chemical, or physical agents relating to water or sewage which are likely to cause human illness, disorders or disability. These include, but are not limited to, pathogenic viruses and bacteria, parasites, toxic chemicals and radioactive isotopes. A malfunctioning onsite wastewater system constitutes a public health hazard.
- 2.78. "Public water source" means a culinary water source, either publicly or privately owned, providing water for human consumption and other domestic uses, as defined in Title R309.
- 2.79. "Pump tank" means a watertight receptacle equipped with a pump and placed after a septic tank or other treatment component.
- 2.80. "Pump vault" means a device installed in a septic or pump tank that houses a pump and screens effluent with 1/8 inch openings or smaller before it enters the pump.
- 2.81. "Recirculation tank" means the tank that receives, stores, and recycles partially treated effluent and recycles that effluent back through the treatment process ~~and to the absorption area.~~
- 2.82. "Regulatory authority" means either the Utah Division of Water Quality or the local health department having jurisdiction.
- 2.83. "Replacement area" means sufficient land with suitable soil, excluding streets, roads, easements and permanent structures, which complies with the setback requirements of these rules, and is intended for the 100 percent replacement of absorption systems.
- 2.84. "Rotary tilling" means a tillage operation. Working land by plowing and harrowing in order to make land ready for cultivation, or employing power driven rotary motion of the tillage tool to loosen, shatter and mix soil.
- 2.85. "Sand lined trench system" means an alternative onsite wastewater system consisting of a series of narrow excavated trenches utilizing sand media and pressure distribution.
- 2.86. "Sand media" means sand fill meeting the ASTM C33/C33M – 11A Standard Specification for Concrete Aggregates.
- 2.87. "Saprolite" means weathered material underlying the soil that grades from soft thoroughly decomposed rock to rock that has been weathered sufficiently so that it can be broken in the hands, cut with a knife or easily dug with a backhoe and is devoid of expansive clay. It has rock structure instead of soil structure and does not include hard bedrock or hard fractured bedrock.
- 2.88. "Scarification" means loosening and breaking up of soil compaction in a manner that prevents smearing and maintains soil structure.
- 2.89. "Scum" means a mass of sewage solids floating on the surface of wastes in a septic tank which is buoyed up by entrained gas, grease, or other substances.

**Comment [G3]:** A Perc Test Certificate should be deemed incomplete without accompanying Soil Logs. Otherwise, how can a reviewer determine if the perc test was done in the correct soil layer? The two should be combined into one Certificate.

- 2.90. "Seepage pit" means an absorption system consisting of one or more deep excavated pits, either hollow-lined or filled, utilizing coarse drain media, with a minimum sidewall absorption depth of 48 inches of suitable soil formation below the distribution pipe.
- 2.91. "Septage" means the semi-liquid material that is pumped out of a septic or pump tank, generally consisting of the sludge, liquid, and scum layer.
- 2.92. "Septic tank" means a watertight receptacle which receives the discharge of a drainage system or part thereof, designed and constructed so as to retain solids, digest organic matter through a period of detention and allow the liquids to discharge into the soil outside of the tank through an absorption system.
- 2.93. "Sequential distribution" means a distribution method in which effluent does not pass through an absorption ~~area~~[trench](#) before it enters the succeeding ~~areas~~[trenches](#) through a distribution box or relief line allowing for portions of the absorption area to be isolated.
- 2.94. "Serial distribution" means a distribution method in which effluent passes through an absorption ~~area~~[trench](#) before entering the succeeding ~~areas~~[trench\(es\)](#) through a distribution box or relief line creating a single uninterrupted flow path.
- 2.95. "Shall" means a mandatory requirement.
- 2.96. "Should" means recommended or preferred and is intended to mean a desirable standard.
- 2.97. "Single-family dwelling" means a building designed to be used as a home by the owner or lessee of such building.
- 2.98. "Sludge" means the accumulation of solids which have settled in a septic tank or a wastewater holding tank.
- 2.99. "Slope" means the ratio of the rise divided by the run between two points, typically described as a percentage (rise divided by run multiplied by 100).
- 2.100. "Soil exploration pit" means an open pit dug to permit examination of the soil to evaluate its suitability for absorption systems. This is also referred to as a "test pit".
- 2.101. "Soil log" means a detailed description of soil characteristics and properties.
- 2.102. "Soil structure" means the way in which the individual particles, sand, silt, and clay, are arranged into larger distinct aggregates called peds. The main types of soil structure are granular, platy, blocky, prismatic, and columnar. Soil may not have a visible structure because it is either single grain or massive.
- 2.103. "Soil texture" means the percent of sand, silt, and clay in a soil mixture. Field methods for judging the texture of a soil are found in Appendix C.
- 2.104. "Standard trench" means an absorption trench utilizing drain media into which effluent is discharged through specially designed distribution pipes.
- 2.105. "Suitable soil" means undisturbed soil that through textural and structural analysis or percolation rate meets the requirements for placement of an absorption system.
- 2.106. "Test Pit" see "soil exploration pit"
- 2.107. "Unapproved system" means any onsite wastewater system which is deemed by the regulatory authority to be:
- A. Any installation without the required regulatory oversight, permits, or inspections;
  - B. Any repairs to an existing system without the required regulatory oversight, permits, or inspections;
  - C. Any alteration to an existing system without the required regulatory oversight, permits, or inspections.
  - [D. Any system that the regulatory agency has allowed to be installed that does not comply with the rules in this code](#)
- 2.108. "U.S.D.A. system of classification" means the system of classifying soil texture used by the United States Department of Agriculture.
- 2.109. "Waste" means dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water (Section 19-5-102).

**Comment [G4]:** A Perc Test Certificate should be deemed incomplete without accompanying Soil Logs. Otherwise, how can a reviewer determine if the perc test was done in the correct soil layer? The two should be combined into one Certificate.

**Comment [G5]:** A Perc Test Certificate should be deemed incomplete without accompanying Soil Logs. Otherwise, how can a reviewer determine if the perc test was done in the correct soil layer? The two should be combined into one Certificate.



- 2.110. "Wastewater" means sewage, industrial waste or other liquid substances which might cause pollution of waters of the state. Intercepted ground water which is uncontaminated by wastes is not included.
- 2.111. "Wastewater holding tank" means a watertight receptacle designed to receive and store wastewater to facilitate treatment at another location.
- 2.112. "Waters of the state" means:
- A. all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private, which are contained within, flow through, or border upon this state or any portion of the state; and,
  - B. does not include bodies of water confined to and retained within the limits of private property, and which do not develop into or constitute a nuisance, or public health hazard, or a menace to fish or wildlife.

### ***R317-4-3. General Standards, Prohibitions, Requirements, and Enforcement.***

- 3.1. Failure to Comply With Rules.  
Any person failing to comply with this rule shall be subject to enforcement action as specified in Sections 19-5-115 and 26A-1-123.
- 3.2. Feasibility.  
Onsite wastewater systems are not feasible for all areas and situations. If property characteristics indicate conditions which may fail in any way to meet the requirements specified herein, the use of onsite wastewater systems shall be prohibited.
- 3.3. Onsite Wastewater System Required.  
The drainage system of each dwelling, building or premises covered herein shall receive all wastewater (including but not limited to bathroom, kitchen, and laundry wastes) and shall have a connection to a public sewer except when such sewer is not available or practicable for use, in which case connection shall be made as follows:
- A. to an onsite wastewater system found to be adequate and constructed in accordance with this rule.
  - B. to any other type of wastewater system acceptable under Rules R317-1, R317-3, R317-5, R317-401, or R317-560.
- 3.4. Flows Prohibited From Entering Onsite Wastewater Systems.  
No ground water drainage, drainage from roofs, roads, yards, or other similar sources shall discharge into any portion of an onsite wastewater system, but shall be disposed of so they will in no way affect the system. Non-domestic wastes such as chemicals, paints, or other substances which are detrimental to the proper functioning of an onsite wastewater system may not be disposed of in such systems.
- 3.5. Increased Flows Prohibited.  
A person may not connect or expand the use of a single-family dwelling or nonresidential facility connected to an existing onsite wastewater system if the projected wastewater flows would be greater than that allowed under the original system construction permit. Expansion may occur if the onsite wastewater system is modified, permitted, and approved by the regulatory authority for the increased flow.
- 3.6. Material Standards.  
All materials used in onsite wastewater systems shall comply with the standards in this rule.
- 3.7. Property Lines Crossed.  
Systems shall be located on the same lot as the building served unless, when approved by the regulatory authority, a perpetual utility easement and right-of-way is established on an adjacent or nearby lot for the construction, operation, and continued maintenance, repair, alteration, inspection, relocation, and replacement of an onsite wastewater system, including all rights to ingress and egress necessary or convenient for the full or complete use, occupation, and enjoyment of the granted easement. The easement shall be large enough to accommodate the proposed onsite wastewater system and replacement area. The easement shall meet the setbacks specified in Table 2.
- 3.8. Initial Absorption Area and Replacement Area.

**Comment [G6]:** What is maximum distance away from building served in order to qualify as "nearby"?

- A. All properties that utilize onsite wastewater systems shall be required to have a replacement area.
- B. The absorption area, including installed system and replacement area, may not be subject to activity that is likely to adversely affect the soil or the functioning of the system. This may include but is not limited to vehicular traffic, covering the area with asphalt, concrete, or structures, filling, cutting or other soil modifications.
- 3.9. Operation and Maintenance.  
Owners of onsite wastewater systems shall operate, maintain, and service their systems according to the standards of this rule .
- 3.10. No Discharge to Surface Waters or Ground Surface.  
Effluent from any onsite wastewater system may not be discharged to surface waters or upon the surface of the ground. Wastewater may not be discharged into any abandoned or unused well, or into any crevice, sinkhole, or similar opening, either natural or artificial.
- 3.11. Repair of a Malfunctioning or Unapproved System.  
Upon determination by the regulatory authority that a malfunctioning or unapproved onsite wastewater system creates or contributes to any dangerous or unsanitary condition which may involve a public health hazard, or noncompliance with this rule, the regulatory authority shall order the owner to take the necessary action to cause the condition to be corrected, eliminated or otherwise come into compliance.
- A. For malfunctioning systems, the local health department shall require and order:
1. All necessary steps such as maintenance, servicing, repairs, and replacement of system components to correct the malfunctioning system;
  2. Effluent quality testing as required by Subsection R317-4-11.3;
  3. Evaluation of the system design including non-approved changes to the system, the wastewater flow, and biological and chemical loading to the system;
  4. Additional tests or samples to troubleshoot the system malfunction.
- B. The regulatory authority may require fees for additional inspections, reviews, and testing.
- 3.12. Procedure for Wastewater System Abandonment.
- A. When a dwelling served by an onsite wastewater system is connected to a public sewer, the septic tank shall be abandoned and shall be disconnected from and bypassed with the building sewer unless otherwise approved by the regulatory authority.
- B. Whenever the use of an onsite wastewater system has been abandoned or discontinued, the owner of the real property on which such wastewater system is located shall render it safe by:
1. having the septic tank, any other tanks, hollow seepage pit, or cesspool:
    - a. wastes pumped out or otherwise disposed of in an approved manner;
    - b. crushed in place and the void filled or the tanks be filled completely with earth, sand, or gravel, within 30 days. The septic tank may also be removed within 30 days at the owner's discretion.
- C. The regulatory authority may require oversight, permit, or inspection of the abandonment process.
- 3.13. Septage Management.  
A person shall only dispose of septage, or sewage contaminated materials in a location or manner in accordance with the regulations of the Division and the local health department having jurisdiction.
- 3.14. Multiple Dwelling Units.  
Multiple dwelling units under individual ownership, except condominiums, may not be served by a single onsite wastewater system except where that system is under the sponsorship of a body politic. Plans and specifications for such systems shall be submitted to and approved by the Division. Issuance of a construction permit by the Board shall constitute approval of plans and authorization for construction. Before the permit is issued, the Division shall review plans with the local health department ~~where~~ the proposed onsite wastewater system ~~would be located~~.

**Comment [G7]:** Replace with "having jurisdiction over"

**Comment [G8]:** delete

## ***R317-4-4. Feasibility Determination.***

### **4.1. General Criteria for Determining Onsite Wastewater System Feasibility.**

The regulatory authority shall determine the feasibility of using an onsite wastewater system. The regulatory authority will review required information for any existing or proposed lot to determine onsite wastewater system feasibility. The required information shall be prepared at the owner's expense by, or under the supervision of, a qualified person approved by the regulatory authority.

#### **A. General Information.**

**The required information shall include:**

1. The county recorder's plat and parcel ID and situs address if available.
2. Name and address of the property owner and person requesting feasibility.
3. The location, type, and depth of all existing and proposed nonpublic water supply sources within 200 feet of the proposed onsite wastewater systems, and of all existing or proposed public water supply sources within 1500 feet of the proposed onsite wastewater systems.
  - a. If the lot is located in aquifer recharge areas or areas of other particular geologic concern, the regulatory authority may require such additional information relative to ground water movement, or possible subsurface wastewater flow.
  - b. If the proposed onsite wastewater system is located within any drinking water source protection zone two, this zone shall be shown.
4. The location and distance to nearest sewer, owner of sewer, whether property is located within service boundary, and size of sewer.
5. Statement of proposed use if other than a single-family dwelling.

#### **B. Soil and Site Evaluation.**

##### **1. Soil Exploration Pit and Percolation Test.**

A minimum of one soil exploration pit shall be excavated to allow the evaluation of the soil. The soil exploration pit shall be constructed and soil log recorded as detailed in Appendix C. The regulatory authority shall ~~have the option of requiring~~ a percolation test in addition to the soil exploration pit. The percolation test shall be conducted as detailed in Appendix D. The regulatory authority shall require additional soil exploration pits, percolation tests, or both where flows are greater than 1000 gallons per day; and may require additional pits, tests, or both where: soil structure varies; limiting geologic conditions are encountered; ~~or, the regulatory authority deems it necessary.~~

- a. Soil exploration pits and percolation tests shall be conducted as closely as possible to the proposed absorption system site. The regulatory authority shall ~~have the option of inspecting~~ the open soil exploration pits and monitoring the percolation test procedure. All soil logs and percolation test results shall be submitted to the regulatory authority.
- b. When there is a substantial discrepancy between the percolation rate and the soil classification, it shall be resolved through additional soil exploration pits, percolation tests, or both.
- c. Absorption systems are generally not feasible in soil types 1, 5, and 6 or are not feasible where the percolation rate is slower than 60 minutes per inch or when faster than 1 minute per inch.
  - i. When packed bed media Systems are allowed by the regulatory authority, soil types 1, 5 or percolation rates up to 120 minutes per inch may be feasible. If the lot size is large enough a soil type 6 may be feasible.

##### **~~d. Excessively Permeable Soil.~~**

~~Type 1 soils having excessively high permeability, such as cobbles or gravels with little fines and large voids, or soils that have a percolation rate faster than 1 minute per inch shall be deemed not feasible for absorption systems.~~

##### **~~e. Blow Sand.~~**

~~The extremely fine grained "blow sand" (Aeolian sand) found in some parts of Utah shall be deemed not feasible for absorption systems. This does not apply to lots which have received final local health department approval prior to the effective date of this rule.~~

**Comment [G9]:** Consider removing this section altogether, as the "required information" does not include approved design plans. Lean on the requirement in the new code for a successful soil profile / perc test and a signed perc test certificate that includes an accurate, clearly mapped location of the successful test. Enforce the soil observation / perc test documentation requirement and use this information in lieu of a "Feasibility Determination". This takes the regulators out of the design business and leaves it to the professionals, where it should be.

All perc test certificates should include a qualifier stating that a successful perc test does not guarantee buildability of a site.

**Comment [G10]:** If this section is retained as a whole, move this up under 4.1 above, as last sentence;

**Comment [G11]:** A Perc Test Certificate should be deemed incomplete without accompanying Soil Logs. Otherwise, how can a reviewer determine if the perc test was done in the correct soil layer? The two should be combined into one Certificate.

i. ~~Percolation test results in blow sand will generally be rapid, but experience has shown that this soil has a tendency to become sealed with minute organic particles within a short period of time. For lots which are exempt as described above, systems may be constructed in such material provided it is found to be within the required range of percolation rates specified in these rules, and provided further that the required area shall be calculated on the assumption of minimum acceptable percolation rate (60 minutes per inch for standard trenches, deep wall trenches, and seepage pits, and 40 minutes per inch for absorption beds).~~

2. Suitable Soil Depth.

For conventional systems, effective suitable soil depth shall extend at least 48 inches or more below the bottom of the dispersal system to bedrock formations, impervious strata, or excessively permeable soil. Some alternative onsite wastewater systems may have other requirements.

3. Ground Water Requirements.

The elevation of the anticipated maximum ground water table shall meet the separation requirements of the anticipated absorption systems. Local health departments and other local government entities may impose stricter separation requirements between absorption systems and the maximum ground water table when deemed necessary. Building lots recorded or having received final local health department approval prior to May 21, 1984 shall be subject to the ground water table separation requirements of the then Part IV of the Code of Waste Disposal Regulations dated June 21, 1967, which states "high ground water elevation shall be at least 1 foot below the bottom of absorption systems and at least 4 feet below finished grade". Notwithstanding this grandfather provision for recorded or other approved lots, the depth to ground water requirements are applicable if compelling or countervailing public health interests would necessitate application of the more stringent requirements of this regulation.

a. Maximum Ground Water.

Maximum ground water table shall be determined where the anticipated maximum ground water table, including irrigation induced water table, might be expected to rise closer than 48 inches to the elevation of the bottom of the onsite wastewater system. Maximum ground water table shall be determined where alternative onsite wastewater systems may be considered based on groundwater elevations. The maximum ground water table shall be determined by:

i. Regular monitoring of the "ground water table" or "ground water table, perched" in an observation well for a period of one year, or for the period of the maximum groundwater table.

(1) Previous ground water records and climatological or other information may be consulted for each site proposed for an onsite wastewater system and may be used to adjust the observed maximum ground water table elevation; or,

ii. Direct visual observation of the maximum ground water table in a soil exploration pit; and,

(1) Observation of soil in a soil exploration pit for evidence of crystals of salt left by the maximum ground water table; or chemically reduced iron in the soil, reflected by redoxmorphic features i.e., a mottled coloring; and,

(2) Previous ground water records and climatological or other information may be consulted for each site proposed for an onsite wastewater system and may be used to adjust the observed maximum ground water table elevation in determining the anticipated maximum ground water table elevation.

iii. In cases where the anticipated maximum ground water table is expected to rise to closer than 34 inches from the original ground surface and an alternative or experimental onsite wastewater system would be considered, previous ground water records and climatological or other information shall be used to adjust the observed maximum ground water table in determining the anticipated maximum ground water table.

b. Curtain Drains.

A curtain drain or other effective ground water interceptor may be allowed as an attempt to lower the groundwater table to meet the requirements of this rule. The regulatory authority shall require that the effectiveness of such devices in lowering the ground water table be demonstrated during the season of maximum ground water table.

~~4. Ground Slope.~~

~~Absorption systems may not be placed on slopes greater than 25 percent or where the addition of fluids is judged to create an unstable slope.~~

5. Other Factors Affecting Onsite Wastewater System Feasibility.

- a. The locations of all rivers, streams, creeks, washes (dry or ephemeral), lakes, canals, marshes, subsurface drains, natural storm water drains, lagoons, artificial impoundments, either existing or proposed, that will affect building sites, shall be provided.
- b. Areas proposed for onsite wastewater systems shall comply with the setbacks in Table 2.
- c. If any part of a property lies within or abuts a flood plain area, the flood plain shall be shown within a contour line and shall be clearly labeled on the plan with the words "flood plain area".

~~6. Unsuitable.~~

~~Where soil and other site conditions are clearly unsuitable, there is no need for conducting soil exploration pits or percolation tests.~~

C. Lot Size.

One of the following two methods shall be used for determining minimum lot size. Determination of minimum lot size by the regulatory authority would not preempt local governments from establishing larger minimum lot sizes.

1. METHOD 1.

The local health department having jurisdiction may determine minimum lot size. Under this method, local health departments may elect to involve other affected governmental entities and the Division in making joint lot size determinations. The Division will develop technical information, training programs, and provide engineering and geohydrologic assistance in making lot size determinations that will be available to local health departments upon their request. Individuals or developers requesting lot size determinations under this method will be required to submit to the local health department, at their own expense, a report which accurately takes into account, but is not limited to, the following factors:

- a. Soil type and depth.
- b. Area drainage, lot drainage, and potential for flooding.
- c. Protection of surface and ground waters.
- d. Setbacks from property lines, water supplies, etc.
- e. Source of culinary water.
- f. Topography, geology, hydrology and ground cover.
- g. Availability of public sewers.
- h. Activity or land use, present and anticipated.
- i. Growth patterns.
- j. Individual and accumulated gross effects on water quality.
- k. Reserve areas for additional subsurface dispersal.
- l. Anticipated wastewater volume.
- m. Climatic conditions.
- n. Installation plans for wastewater system.
- o. Area to be utilized by dwelling and other structures.

2. METHOD 2.

- a. Whenever local health departments do not establish minimum lot sizes for single-family dwellings that will be served by onsite wastewater systems, the requirements of Table 1 shall be met.
- b. For non-residential facilities, one-half of the lot must be available for the absorption system and replacement area.

#### 4.2. Subdivision Onsite Wastewater System Feasibility Determination.

In addition to information in Subsection R317-4-4.1, the following information must be provided.

- A. A plat map with the proposed street and lot layout, the size and dimensions of each lot and the location of all water lines and easements, and if possible, the areas proposed for wastewater dispersal. All lots shall be consecutively numbered. The minimum required area of each lot shall be sufficient to permit the safe and effective use of an onsite wastewater system and shall include a replacement area for the absorption system.
- B. Surface drainage systems shall be included on the plan, as naturally occurring, and as altered by roadways or any drainage, grading or improvement, installed or proposed by the developer. The details of the system shall show the surface drainage structures, whether ditches, pipes, or culverts, will in no way affect onsite wastewater systems on the property.
- C. Each proposed lot shall have at least one soil exploration pit, percolation test, or both.  
The regulatory authority may allow fewer tests based on the uniformity of prevailing soil and ground water characteristics and available percolation or soil log test data. If soil conditions and surface topography indicate, a greater number of soil exploration pits or percolation tests may be required by the regulatory authority. Whenever available, information from published soil studies of the area of the proposed subdivision shall be submitted for review
  - 1. The location of all soil exploration pits and percolation test holes shall be clearly identified on the subdivision final plat and identified by a key number or letter designation. The results of such soil tests, including stratified depths of soils and final percolation rates for each lot shall be recorded on or with the final plat. Soil exploration pits and percolation tests shall be conducted as closely as possible to the dispersal system sites on the lots or parcels.
- D. If soil or site conditions exist in or near the project so as to complicate design and location of an onsite wastewater system, a detailed system layout shall be provided for those lots presenting the greatest design difficulty by meeting rules in the following Section R317-4-5.

#### 4.3. Statement of Feasibility.

After review of all information, plans, and proposals, the regulatory authority shall make a written determination of feasibility stating the results of the review or the need for additional information.

- A. An affirmative statement of feasibility for a subdivision does not imply that it will be possible to install onsite wastewater systems on all of the proposed lots, but shall mean that such onsite wastewater systems may be installed on the majority of the proposed lots in accordance with minimum State requirements and any conditions that may be imposed.
- B. Expiration.  
The regulatory authority shall establish the expiration, if any, of the statement of feasibility.

**Comment [G12]:** If this section is intended to address Subdivision feasibility, its section number should be subordinate to section 4.2 above. What "plans" are being reviewed here?

### ***R317-4-5. Plan Review and Permitting.***

#### 5.1 Plan Review and Permitting.

- A. Domestic Wastewater.  
Plans and specifications for the construction, alteration, extension, or change of use of onsite wastewater systems which receive domestic wastewater, prepared by an individual certified in accordance with Rule R317-11, shall be submitted to the regulatory authority. Details for said site, plans, and specifications are listed in Section R317-4-6.
- B. Non-Domestic Wastewater.  
Plans and specifications for the construction, alteration, extension, or change of use of onsite wastewater systems which receive non-domestic wastewater shall be submitted to and approved by the local health department having jurisdiction and the Division.
- C. Construction Permit Required.  
The regulatory authority shall review said plans and specifications as to their adequacy of design for the intended purpose, and shall, if necessary, require such changes as are required by these rules. When the reviewing regulatory authority is satisfied that plans and specifications are adequate for the conditions under which a system is to be installed and used, a construction permit shall be issued to the individual making the submittal. Construction may not commence until the construction permit has been issued by the regulatory authority.

D. Information Required.

Plans submitted for review shall be drawn to scale (1" = 10', 20' or 30', or dimensions indicated as approved by the regulatory authority). Plans shall be prepared in such a manner that the contractor can read and follow them in order to install the system properly. Depending on the individual site and circumstances, or as determined by the regulatory authority, some or all of the following information may be required:

1. Applicant Information.

- a. The name, current address, and telephone number of the applicant;
- b. Complete address, legal description of the property, or both to be served by this onsite wastewater system.

2. Plot Plan.

- a. Date of plan;
- b. North arrow;
- c. Lot size and dimensions;
- d. Legal description of property
- e. Ground surface contours (preferably at 2 foot intervals) of both the original and final (proposed) grades of the property, or relative elevations using an established bench mark;
- f. Location and dimensions of paved and unpaved driveways, roadways and parking areas;
- g. Location and explanation of type of dwelling to be served by an onsite wastewater system;
- h. Maximum number of bedrooms (including statement of whether a finished or unfinished basement will be provided), or if other than a single family dwelling, the number of occupants expected and the estimated gallons of wastewater generated per day;
- i. Location and dimensions of the essential components of the wastewater system;
- j. Location of all soil exploration pits and all percolation test holes;
- k. Location of building sewer and water service line to serve the building;
- l. The location, type, and depth of all existing and proposed nonpublic water supply sources within 200 feet of onsite wastewater systems, and of all existing or proposed public water supply sources within 1500 feet of onsite wastewater systems and associated source protection zones;
- m. Distance to nearest public water main and size of main;
- n. Distance to nearest public sewer, size of sewer, and whether accessible by gravity;
- o. Location of easements or drainage right-of-ways affecting the property;
- p. Location of all streams, ditches, watercourses, ponds, subsurface drains, etc., (whether intermittent or year-round) within 100 feet of proposed onsite wastewater system.

3. Statement indicating the source of culinary water supply (whether a well, spring, non public or public system), its location and distances from all onsite wastewater systems within 200'.

4. Soil Logs, Percolation Test Certificates, or both.

5. Statement with supporting evidence indicating the maximum anticipated ground water table and the flooding potential for onsite wastewater system sites.

6. Relative elevations (using an established bench mark) of the:

- a. Building drain outlet;
- b. The inlet and outlet inverts of the septic tank(s);
- c. The outlet invert of the distribution box (if provided) and the ends or corners of each distribution pipe lateral in the absorption system;
- d. The final ground surface over the absorption system;

**Comment [G13]:** This allows for plans to be drawn not-to-scale, thereby allowing owners to draw plans without an existing conditions survey. One cannot produce a proper design without an existing conditions survey that depicts all potentially relevant features. Get serious about protecting Utah groundwater and require design plans that are professionally prepared (to scale), readily reviewable by the Department/Division, and executable by the Contractor.

Allowing sketches drawn not-to-scale simply facilitates cheating on setbacks and convenient omission of information that may render a lot problematic or more costly to develop.

**Comment [G14]:** Revise to read "Design Plan"

**Comment [G15]:** Revise to read: "at one-foot or two-foot contour interval, as appropriate for the slopes depicted"

**Comment [G16]:** delete

**Comment [G17]:** Add a separate line item under 2. Plot Plan for "Elevation Bench Mark". Require at least two elevation bench marks to be shown on the design plan. Require the elevation bench marks to be described on the design plan so that someone who has not been to the site can find them on arrival.

**Comment [G18]:** A Perc Test Certificate should be deemed incomplete without accompanying Soil Logs. Otherwise, how can a reviewer determine if the perc test was done in the correct soil layer? The two should be combined into one Certificate.

**Comment [G19]:** Delete the word "relative"

**Comment [G20]:** Revise to read "referencing an established bench mark"

**Comment [G21]:** Add line item for elevation of bottom of absorption area excavation

**Comment [G22]:** Change "final" to "finish"

**Comment [G23]:** Add: "and finish ground surface of any required fill associated with any component of the system"



- e. Septic tank access cover, including height and diameter of riser, if used;
- f. Pump tank inlet (if used) including height and diameter of riser.
- 7. Schedule or grade, material, diameter, and minimum slope of building sewer.
- 8. Septic tank and pump tank (if provided) capacity, design (cross sections, etc.), materials, and dimensions. If tank is commercially manufactured, state the name and address of manufacturer.
- 9. Details of drop boxes or distribution boxes (if provided).
- 10. Absorption system details which include the following:
  - a. Schedule or grade, material, and diameter of distribution pipes.
  - b. Required and proposed area for absorption system.
  - c. Length, slope, and spacing of each distribution pipeline.
  - d. Maximum slope across ground surface of absorption system area.
  - e. Slope of distribution pipelines (maximum slope 4 inches/100 ft., level preferred).
  - f. Distance of distribution pipes from trees, cut banks, fills, or subsurface drains.
  - g. Type and size of drain media to be used or chambered trench specifications.
  - h. Cross section of absorption system showing:
    - i. Depth and width of absorption system excavation;
    - ii. Depth of distribution pipe;
    - iii. Depth of filter material;
    - iv. Barrier material (i.e., synthetic filter fabric, straw, etc.) used to separate filter material from cover;
    - v. Depth of cover.
- 11. Pump (if provided) details as referenced in Appendix B.
- 12. If an Alternative System is designed, include all pertinent information to allow plan review and permitting for compliance with this rule.
- 13. All applicants requesting plan approval for an onsite wastewater system shall submit a sufficient number of copies of the above required information to enable the regulatory authority to retain one copy as a permanent record.
- 14. Applications may not be accepted if proper information is not submitted.

## ***R317-4-6. Design Requirements.***

### **6.1. System Location.**

- A. Onsite wastewater systems are not suitable ~~for all~~ in some areas and situations. Location and installation of each system shall be such that with reasonable maintenance, it will function in a sanitary manner and will not create a nuisance, public health hazard, or endanger the quality of any waters of the State.
- B. Systems, including replacement areas, shall be located on the same lot as the building served unless, when approved by the regulatory authority, a perpetual utility easement and right-of-way is established on an adjacent or nearby lot for the construction, operation, and continued maintenance, repair, alteration, inspection, relocation, and replacement of an onsite wastewater system, to include all rights to ingress and egress necessary or convenient for the full or completed use, occupation, and enjoyment of the granted easement. The easement shall:
  - 1. Include the portion of the onsite wastewater system which extends beyond the property line;
  - 2. Meet the applicable setbacks of Table 2.

**Comment [G24]:** What is maximum distance away from building served in order to qualify as "nearby"?



C. In determining a suitable location for the system, due consideration shall be given to such factors as: the minimum setbacks in Table 2; size and shape of the lot; slope of natural and finished grade; location of existing and future water supplies; depth of ground water and bedrock; soil characteristics and depth; potential flooding or storm catchment; possible expansion of the system; and, future connection to a public sewer system.

#### 6.2. Minimum Setback Distances.

A. All systems, including the replacement area, shall conform to the minimum setback distances in Table 2.

#### 6.3. Estimates of Wastewater Quantity.

##### A. Single Family Dwellings.

A minimum of 300 gallons per day (1 or 2 bedroom) and 150 gallons per day for each additional bedroom shall be used.

**Comment [G25]:** A minimum of 300 GPD is appropriate. But 150 GPD per bedroom is not. Research shows that average culinary water use in a single family home is 45-60 GPD per bedroom, and dropping. Suggest 100 GPD per bedroom to account for peak days.

##### B. Non-Single Family Dwellings.

The quantity of wastewater shall be determined accurately, preferably by actual measurement. Metered water supply figures for similar installations can usually be relied upon, providing the nondisposable consumption, if any, is subtracted. Where this data is not available, the minimum design flow figures in Table 3 shall be used to make estimates of flow.

##### C. Design Capacity.

In no event shall the anticipated maximum daily wastewater flow exceed the capacity for which a system is designed.

#### 6.4. Non-Domestic Effluent.

Effluent shall be treated to levels at or below the defined parameters of non-domestic effluent before being discharged into an absorption system.

#### 6.5. Building Sewer.

A. The building sewer shall have a minimum inside diameter of 4 inches and shall comply with the minimum standards in Table 4.

B. Building sewers shall be laid on a uniform minimum slope of not less than 1/4 inch per foot (2.08 percent slope).

**Comment [G26]:** Suggest revising to "2.0 percent (1/4 inch per foot is 2.08%)"

C. The building sewer shall have a minimum of one cleanout and cleanouts every 100 feet.

1. A cleanout is also required for each aggregate horizontal change in direction exceeding 135 degrees.
2. 90 degree ~~ells~~ are not recommended.

**Comment [G27]:** Revise to read "bends"

D. Building sewers shall be separated from water service pipes in separate trenches and by at least 10 feet horizontally except that they may be placed in the same trench when the following three conditions are met:

1. The bottom of the water service pipe, at all points, shall be at least 18 inches above the top of the building sewer.
2. The water service pipe shall be placed on a solid shelf excavated at one side of the common trench with a minimum clear horizontal distance of at least 18 inches from the sewer or drain line.
3. The number of joints in the water service pipe should be kept to a minimum, and the materials and joints of both the sewer and water service pipes shall be of strength and durability to prevent leakage under adverse conditions.
4. If the water service pipe shall cross the building sewer, it shall be at least 18 inches above the latter within 10 feet of the crossing. Joints in water service pipes should be located at least 10 feet from such crossings.

**Comment [G28]:** Add: "(outside face of water pipe to outside face of sewer/drain pipe)"

**Comment [G29]:** Add: "(outside face of water pipe to outside face of sewer/drain pipe)"

5. If the building sewer crosses the water service pipe it shall sleeved on 10' of either side of the crossing

**Comment [G30]:** Add: "(outside face of water pipe to outside face of sewer/drain pipe)"

E. Building sewer placed under driveways or other areas subjected to heavy loads shall receive special design considerations to ensure against crushing or disruption of alignment.

#### 6.6. Septic Tank.

All septic tanks shall meet the requirements of Appendix "A" and be approved by the Division.

A. Liquid capacity.

1. A septic tank that serves a non-residential facility shall have a liquid capacity of at least 1 ½ times the designed daily wastewater flow. In all cases the capacity shall be at least 1,000 gallons.
2. The capacity of a septic tank that serves a single family dwelling shall be based on the number of bedrooms that can be anticipated in the dwelling served, including the unfinished space available for conversion as additional bedrooms. Unfinished basements shall be counted as a minimum of one additional bedroom.
  - a. The minimum liquid capacity of the tank shall be 1000 gallons for up to three bedroom homes.
  - b. The minimum liquid capacity of the tank shall be 1,250 gallons for four bedroom homes.
  - c. 250 gallons per bedroom shall be added to the liquid capacity of the tank for each additional bedroom over four bedrooms.
3. The regulatory authority may require a larger capacity than specified in this subsection as needed for unique or unusual circumstances such as....

B. Tanks in Series.

Additional septic tank capacity over 1,000 gallons may be obtained by joining tanks in series to obtain the required capacity providing the following are complied with:

1. No tank in the series shall be smaller than 1,000 gallons;
2. The capacity of the first tank shall be at least two thirds of the required total septic tank volume. If compartmented tanks are used, the compartment of the first tank shall have this two thirds capacity;
3. The connecting pipes between each successive tank shall meet the slope requirements of the building sewer and shall be unrestricted except for the inlet to the first tank and the outlet for the last tank;

C. Maximum Number of Tanks or Compartments.

The maximum number of tanks and compartments in series may not exceed three.

D. Inlets and Outlets.

Inlet or outlet devices shall conform to the following:

1. Approved tanks with offset inlets may be used where they are warranted by constraints on septic tank location;
2. Multiple outlets from septic tanks shall be prohibited unless preauthorized by the regulatory authority;
3. A gas deflector may be added at the outlet of the tank to prevent solids from entering the outlet pipe of the tank.

E. Effluent Screens.

All septic tanks may have an effluent screen installed at the outlet of the terminal tank. The screen shall prevent the passage of solid particles larger than a nominal 1/8 inch diameter sphere. The screen shall be easily removable for routine servicing by installing a riser to the ground surface, with an approved cover. Effluent screens are required for non-domestic wastewater systems, unless screening is achieved by some other means acceptable to the regulatory authority.

**Comment [G31]:** Revise to read "shall". There is no advantage to leaving this out of a system. This is arguably the best bang for the buck in the entire system.

**Comment [G32]:** Use either the term "screen" or "filter" consistently throughout document.

F. Access to Tank Interior.

Adequate access to the tank shall be provided to facilitate inspection, pumping, servicing, and maintenance, and shall have no structure or other obstruction placed over it and shall conform to the following requirements:

1. Riser Heights.

Watertight risers are required; extending to within 6 inches of the surface of the ground when soil covering the septic tank is greater than 6 inches. Preferably, the riser should be brought up to the finished grade to encourage periodic servicing and maintenance.

- a. If a septic tank is located under paving or concrete, risers shall be extended up through the paving or concrete.
- b. If non-domestic wastewater is generated, risers shall be extended to the finished grade.

2. Riser Diameter.

The inside diameter of the riser shall be a minimum of 20 inches.

3. Riser Covers.

Riser covers shall be designed and constructed in such a manner that: they cannot pass through the access openings; when closed will be child-proof; will prevent entrance of surface water, dirt, or other foreign materials; and, seal odorous gases in the tank.

4. Riser Construction.

The risers shall be constructed of durable, structurally sound materials which are approved by the regulatory authority and designed to withstand expected physical loads and corrosive forces.

5. Multiple Risers Required.

When the tank capacity exceeds 3,000 gallons, a minimum of two access risers shall be installed.

G. Other Requirements.

Tank installation shall conform to the following requirements:

1. Ground Water.

a. Septic tanks located in high groundwater areas shall be designed with the appropriate weighted or anti-buoyancy device to prevent flotation in accordance with the manufacturer's recommendations.

b. The building sewer inlet of the tank may not be installed at an elevation lower than the highest anticipated groundwater elevation.

2. Depth of Septic Tank.

The minimum depth of cover over the septic tank shall be at least 6 inches and a maximum of 48 inches at final grading. For unusual situations, the regulatory authority may allow a deeper burial provided the following conditions are met:

a. The tank shall be approved by the Division for the proposed depth and burial cover load.

b. Risers shall:

i. be installed over the access openings of the inlet and outlet baffles or sanitary tees;

ii. conform to Subsection R317-4-6.6.F, except risers shall be at least 24 inches in diameter;

c. The water tightness test required in Subsection R317-4-8.1.A shall be performed prior to backfill.

6.7. Grease Interceptor Tanks.

A grease interceptor tank or automatic grease removal device may be required by the regulatory authority to receive the drainage from fixtures and equipment with grease-laden waste. It shall be sized according to the current Plumbing Code.

A. Accessibility and Installation.

Tanks installed in the ground shall conform to Subsection R317-4-6.6.F for accessibility and installation, except risers are required and shall be brought to the surface of the ground. All interior compartments shall be accessible for inspecting, servicing, and pumping.

6.8. Pump and Recirculation Tanks.

A. Tanks shall be constructed of concrete or other durable material resistant to corrosion and of sufficient strength to withstand soil pressures related to the depth of installation.

B. Pump tank volume shall have a liquid capacity adequate for the minimum operating volume (the dead space, dosing volume, and surge capacity), and shall have the emergency operation capacity of either:

1. storage capacity for the system design daily wastewater flow; or,

2. at least two independent power sources with appropriate wiring installed.

C. Accessibility and Installation.

Tanks shall conform to Subsection R317-4-6.6.F for accessibility and installation, except risers are required and shall be brought to the surface of the ground. All interior compartments shall be accessible for inspecting, servicing, and pumping.

D. Outlets of septic tanks upstream of pump tanks shall be fitted with an effluent filter.

**Comment [G33]:** Unnecessary/wasteful for single family homes.

**Comment [G34]:** Delete this section. All septic tanks should have an effluent filter. See comment above.

#### 6.9. Pump Vaults.

Pump vaults may be used when approved by the regulatory authority.

- A. The vault shall be constructed of durable material and resistant to corrosion.
- B. The vault shall have an easily accessible screen with 1/8 inch openings or smaller.
- C. All components of the vault shall be accessible from the surface.
- D. When a pump vault is used in any tank other than a pump tank:
  - 1. The tank size shall be increased by the larger of the following:
    - a. 250 gallons; or,
    - b. 10% of the required capacity of the tank.
  - 2. At least two independent power sources with appropriate wiring shall be installed.
  - 3. The maximum drawdown per dose shall be no more than 2 inches.

**Comment [G35]:** Delete this.

**Comment [G36]:** Why?

#### 6.10. Pumps.

See Appendix B for details.

#### 6.11. Sampling Ports.

When a system is required to have effluent sampling or receives non-domestic wastewater, the system shall include a sampling port at an area approved by the regulatory authority capable of sampling effluent prior to the absorption system.

#### 6.12. Effluent Sewer.

- A. The effluent sewer shall have a minimum inside diameter of 4 inches and shall comply with the minimum standards in Table 4.
- B. The effluent sewer shall extend at least 5 feet beyond the septic tank before entering the absorption system.
- C. Effluent sewers shall be laid on a uniform minimum slope of not less than 1/4 inch per foot (2.08 percent slope). When it is impractical, due to structural features or the arrangement of any building, to obtain a slope of 1/4 inch per foot, a sewer pipe of 4 inches in diameter or larger may have a slope of not less than 1/8 inch per foot (1.04 percent slope) when approved by the regulatory authority.
- D. The effluent sewer lines shall have cleanouts at least every 100 feet.
- E. In gravity-flow absorption systems with multiple distribution lines, the effluent sewer may not be in direct line with any one of the distribution lines, except where drop boxes or distribution boxes are used.
- F. Effluent sewer placed under driveways or other areas subjected to heavy loads shall receive special design considerations to ensure against crushing or disruption of alignment.

**Comment [G37]:** Suggest revising to "2.0 percent (1/4 inch per foot is 2.08%)"

**Comment [G38]:** Suggest revising to "2.0 percent"

**Comment [G39]:** Suggest revising to "1.0 percent (1/8 inch per foot is 1.04%)"

#### 6.13. Absorption Systems.

##### A. System Types.

- 1. Absorption Trenches.
  - a. Standard Trenches.
  - b. Chambered Trenches.
  - c. Bundled Synthetic Aggregate Trenches.
- 2. Absorption Beds.
- 3. Deep Wall Trenches.
- 4. Seepage Pits.

##### B. General Requirements.

- 1. Replacement Area for Absorption Systems.

Adequate and suitable land shall be reserved and kept free of permanent structures, traffic, or

adverse soil modification for 100 percent replacement of each absorption system. If approved by the regulatory authority, the area between standard trenches or deep wall trenches may be regarded as replacement area.

- a. In lieu of a replacement area, two complete absorption systems shall be installed with a diversion valve. The valve shall be accessible from the finished grade. The valve should be switched at least annually.

2. Protection of Absorption Systems.

The site of the initial and replacement absorption system may not be covered by asphalt, concrete, or structures, or be subject to vehicular traffic, ~~livestock~~, or other activity that would adversely affect the soil, such as - construction material storage, soils storage, etc. This protection applies to before and after construction of the underground wastewater system.

3. Sizing Criteria for Absorption Systems.

Absorption systems shall be sized based on Table 5 or Table 6.

4. Design Criteria for Absorption Systems.

Many different designs may be used in laying out absorption systems, the choice depending on the size and shape of the available areas, the capacity required, and the topography of the dispersal area.

a. Horizontal Setbacks.

Absorption systems shall comply with the setbacks in Table 2.

b. Sloping Ground.

Absorption systems placed in 10% or greater sloping ground shall be designed so that there is a minimum of 10 feet of undisturbed earth measured horizontally from the bottom of the distribution line to the ground surface. Drip disposal shall be installed as per manufacturer's specifications

c. Undisturbed Natural Earth.

That portion of absorption systems below the top of distribution pipes shall be in undisturbed natural earth.

d. Tolerance.

All piping, chambers, and the bottoms of absorption system excavations shall be close level with less than 4 inches difference per 100'.

e. Distribution Pipe.

Distribution pipe for gravity-flow absorption systems shall be 4 inches in diameter and shall comply with the minimum standards in Table 4.

- i. The pipe shall be penetrated by at least two rows of round holes, each ½ inch in diameter, and located at approximately six inch intervals. The perforations should be located at about the five o'clock and seven o'clock positions on the pipe.

- ii. The open ends of the pipes shall be capped.

It is recommended that distribution pipes have cleanouts for flushing and jetting of the laterals

f. Absorption System Laterals.

Absorption system laterals should be designed to receive proportional flows of wastewater.

g. Drain Media Protection.

Drain media shall be covered with a barrier material before being covered with earth backfill.

h. Prohibitions.

- i. In gravity-flow absorption systems with multiple distribution lines, the effluent sewer may not be in direct line with any one of the distribution pipes, except where drop boxes or distribution boxes are used.

- ii. Any section of distribution pipe laid with non-perforated pipe may not be considered in determining the required absorption area.

- iii. Distribution pipe may ~~not be~~ placed under driveways or other areas subjected to heavy loads shall be designed with special consideration.

**Comment [G40]:** Use consistent terminology; "on-site wastewater system"

i. Exceptions.

Deep wall trenches and filled seepage pits may be allowed beneath unpaved driveways on a case-by-case basis by the regulatory authority, if the top of the distribution pipe is at least 3 feet below the final ground surface.

C. Pump to Absorption System.

1. If a pump is used to lift effluent to an absorption system, the pump tank or pump vault shall meet the requirements of Subsections R317-4-6.8 or R317-4-6.9 and the pump and controls shall meet the requirements of Appendix B.
2. Pumping to an absorption system may not warrant any reductions to the absorption area.

**Comment [G41]:** Revise to read "shall"

D. Effluent Distribution Devices.

1. Distribution Boxes.

Distribution boxes may be used on level or nearly level ground. They shall be watertight and constructed of concrete or other durable material. They shall be designed to accommodate the inlet pipe and the necessary distribution lines.

**Comment [G42]:** Ambiguous. Suggest allowing where ground slope is 20% or less.

- a. The outlet inverts of the distribution box shall be not less than 1 inch below the inlet invert.

b. The distribution box shall have a riser and lid unless within 1' of finished grade. In all cases a steel marking locator shall be placed by the box.

2. Drop Boxes.

Drop boxes may be used to distribute effluent within the absorption system and shall meet the following requirements:

- a. Drop boxes shall be designed to accommodate the inlet pipe, an outlet pipe leading to the next drop box (except for the last drop box), and one or two distribution pipes leading to the absorption system.
- b. The inlet pipe to the drop box shall be at least 1 inch higher than the outlet pipe leading to the next drop box.
- c. The invert of the distribution pipes(s) shall be 1 to 6 inches below the outlet invert. If there is more than one distribution pipe, their inverts shall be at exactly the same elevation.

d. Drop boxes shall have a riser and lid unless within 1' of finished grade. In all cases a steel marking locator shall be placed by the box.

3. Other Devices.

Tees, wyes, ells, or other distributing devices may be used as needed to permit proportional flow to the branches of the absorption system.

E. Effluent Distribution Methods.

1. Closed Loop.

In locations where the slope of the ground over the absorption system area is relatively flat, the trenches should be interconnected to produce a closed loop system and the trenches shall be installed at the same elevations.

2. Non-Closed Loop.

If a non-closed loop design is used, effluent shall be proportionally distributed to each lateral.

3. Serial or Sequential.

Serial or sequential distribution may be used in absorption systems designed for sloping areas, or where absorption system elevations are not equal.

- a. Serial trenches shall be connected with a drop box or watertight overflow line in such a manner that a trench will be filled before the effluent flows to the next lower trench.
- b. The overflow line shall be a 4 inch solid pipe with direct connections to the distribution pipes. It should be laid in a connecting trench excavated to the exact depth required. Care must be exercised to ensure a block of undisturbed earth remains between trenches. Backfill should be carefully tamped.

F. Design of Absorption Systems.

- i. An absorption system shall be designed to approximately follow the ground surface contours so that variation in excavation depth will be minimized. The excavations could be installed at different elevations, but the bottom of each individual excavation shall be level throughout its length.
- ii. Absorption systems should be constructed as shallow as is possible to promote treatment and evapotranspiration.

1. Absorption Trenches.

Absorption trenches shall conform to the following:

- i. The minimum required effective absorption area shall be calculated using Table 5 or Table 6.
- ii. Minimum number of absorption trenches 2.
- iii. Maximum length of absorption trenches 150 feet.
  - (1) Does not include connecting trenches.
- iv. Minimum spacing of absorption trenches (wall to wall) 7 feet.
- v. Minimum width of absorption trench excavations 24 inches.
- vi. Maximum width of absorption trench excavations 36 inches.
- vii. Minimum depth of absorption trench excavations below original (natural) grade 10 inches.
- viii. Minimum depth of soil cover over the absorption trenches 6 inches.
- ix. Minimum separation from the bottom of the absorption trenches to:
  - (1) The anticipated maximum ground water table 24 inches.
  - (2) Unsuitable soil or bedrock formations 48 inches.
- x. Observation ports may be placed to observe the infiltrative surfaces of the trenches.

a. Standard Trenches.

Standard trenches shall conform to the following:

- i. The effective absorption area of standard trenches shall be calculated as the total bottom area of the excavated trench system in square feet.
- ii. Top of effluent pipe may not be installed above original (natural) grade.
- iii. The distribution pipe shall be centered in the absorption trench and placed the entire length of the trench.
- iv. Drain media shall extend the full width and length of the trenches to a depth of at least 12 inches.
- v. Minimum depth of drain media under the distribution pipe 6 inches.
- vi. Minimum depth of drain media over the distribution pipe 2 inches.
- vii. Minimum depth of cover over the barrier material 6 inches.

b. Chambered Trenches.

Chambered trenches shall conform to the following:

- i. All chambers shall meet International Association of Plumbing and Mechanical Officials (IAPMO) standard PS 63-2005, which is hereby incorporated into this rule by reference.
- ii. The minimum required effective absorption area of chambered trenches shall be calculated:
  - (1) For Type A Chambers as 36 inches; and,
  - (2) For Type B Chambers as 24 inches.
  - (3) Using Table 5 or Table 6 and may be reduced by 30 percent.
- ii. The chambered trenches shall be designed and installed in conformance with manufacturer recommendations, as modified by these rules.

- iv. Type A Chambers:
  - (1) Minimum width of chambers 30 inches.
  - (2) Maximum width of trench excavations 36 inches.
- v. Type B Chambers:
  - (1) Minimum width of chambers 22 inches.
  - (2) Maximum width of trench excavations 24 inches.
- vi. Minimum elevation of the inlet pipe invert from the bottom of the chamber 6 inches.
- vii. All chambers shall have a splash plate under the inlet pipe or another design feature to avoid unnecessary channeling into the trench bottom.
- viii. Inlet and outlet effluent sewer pipes shall enter and exit the chamber endplates.
- ix. Minimum depth of cover over the chambers 12 inches.
- c. Bundled Synthetic Aggregate Trenches.
 

Bundled synthetic aggregate trenches shall conform to the following:

  - i. All synthetic aggregate bundles shall meet International Association of Plumbing and Mechanical Officials (IAPMO) standards for the General, Testing and Marking & Identification of the guide criteria for Bundled Expanded Polystyrene Synthetic Aggregate Units.
  - ii. The effective absorption area of bundled synthetic aggregate trenches shall be calculated as the total bundle length times the total bundle width in square feet.
  - iii. The bundled synthetic aggregate trenches shall be designed and installed in conformance with manufacturer recommendations, as modified by these rules.
  - iv. Only 12 inch diameter bundles are approved in this rule.
    - (1) For bundles with perforated pipe the minimum depth of synthetic aggregate under pipe 6 inches.
  - v. Width of trenches.
    - (1) When designed for a 3 foot wide trench, three bundles are laid parallel to each other with the middle bundle containing perforated pipe.
    - (2) When designed for a 2 foot wide trench, two bundles are placed on the bottom, with one bundle containing perforated pipe.
  - vi. Minimum depth of cover over the bundles 12 inches.
- 2. Absorption Beds.
 

Absorption beds shall conform to the requirements applicable to absorption trenches, except for the following:

  - a. The minimum required effective absorption area shall be calculated using Table 5 or Table 6.
  - b. The effective absorption area of absorption beds shall be considered as the total bottom area of the excavated bed system in square feet.
  - c. Absorption beds may be built over naturally existing soil types 1 through 3 or soils with a percolation rate between 1 and 40 minutes per inch.
  - d. The bottom of the entire absorption bed shall be level.
  - e. The distribution pipes or chambers shall be interconnected to produce a closed loop distribution system.
  - f. Minimum number of laterals in an absorption bed 2.
  - g. Maximum length of laterals in an absorption bed 150 feet.
  - h. Maximum distance between laterals 6 feet.

**Comment [G43]:** Are we using the term "Soil Type" or "Soil Class"?

**Comment [G44]:** Revise to 60 MPI



- i. Minimum distance between laterals and sidewalls 1 foot.
  - j. Maximum distance between laterals and sidewalls 3 feet.
  - k. Minimum distance between absorption beds 7 feet.
  - l. Minimum depth of an absorption bed excavation from original (natural) grade 10 inches.
  - m. Absorption beds with drain media:
    - i. Minimum depth of drain media under distribution pipe 6 inches.
    - ii. Minimum depth of drain media over distribution pipe 2 inches.
    - iii. Minimum depth of cover over the barrier material 6 inches.
  - n. Absorption beds with chambers:
    - i. Chambers shall be installed with sides touching, no separation allowed.
    - ii. All chambers shall be connected in a closed loop distribution system.
    - iii. The outlet side of the chamber runs shall be connected through the bottom port of the end plates.
    - iv. No absorption area reduction factor shall be given for using chambers in absorption beds.
    - v. Minimum depth of cover over the chambers 12 inches.
3. Deep Wall Trenches.
- Deep wall trenches shall conform to the following:
- a. The minimum required effective absorption area shall be calculated using Table 5 or Table 6.
  - b. The effective absorption area of deep wall trenches shall be calculated using the total trench vertical sidewall area below the distribution pipe. The bottom area and any highly restrictive or impervious strata or bedrock formations may not be considered in determining the effective sidewall absorption area.
  - c. If percolation tests are used, they shall be conducted in accordance with Appendix D and in the most restrictive soil horizon.
  - d. Maximum length of trenches 150 feet.
    - i. Does not include connecting trenches.
  - e. Minimum spacing of trenches (wall to wall) 12 feet
    - or 3 times the media depth, whichever is the larger distance.
  - f. Vertical depth of trenches
    - i. Minimum effective sidewalls 2 feet.
    - ii. Maximum effective sidewalls 10 feet.
    - iii. Calculate using only suitable soil formation.
  - g. Minimum width of trench excavations 24 inches.
  - h. Minimum separation from the bottom of deep wall trench to:
    - i. The anticipated maximum ground water table 48 inches.
    - ii. Unsuitable soil or bedrock formations 48 inches.
  - i. Drain media shall cover the coarse drain media to permit leveling of the distribution pipe and shall extend the full width and length of the trenches:
    - i. Minimum depth of drain media 12 inches.
    - ii. Minimum depth of drain media under the distribution pipe 6 inches.
    - iii. Minimum depth of drain media over the distribution pipe 2 inches.

**Comment [G45]:** Regardless of absorption area type, chambers should not warrant a reduction in required absorption area.

- h. Minimum depth of cover over the barrier material 6 inches.
- i. The distribution pipe shall be centered in the trench and placed the entire length of the trench.

4. Seepage Pits.

Seepage pits shall be considered as modified deep wall trenches and shall conform to the requirements applicable to deep wall trenches, except for the following:

- a. The minimum required effective absorption area shall be calculated using Table 5 or Table 6.
- b. The effective absorption area of seepage pits shall be calculated using the total pit vertical sidewall area below the distribution pipe. The bottom area and any highly restrictive or impervious strata or bedrock formations may not be considered in determining the effective sidewall absorption area.
- c. Minimum diameter of pits 3 feet.
- d. Vertical depth of pits
  - i. Minimum effective sidewalls 4 feet.
  - ii. Maximum effective sidewalls 10 feet.
  - iii. Calculate using only suitable soil formation.

e. Filled Seepage Pits:

- i. In pits filled with coarse drain media, the perforated distribution pipe shall run across each pit. A layer of drain media shall be used for leveling the distribution pipe.
- ii. The entire pit shall be completely filled with coarse drain media to at least the top of any permeable soil formation to be calculated as effective sidewall absorption area.

f. Hollow-Lined Seepage Pits:

- i. For hollow-lined pits, the inlet pipe shall extend horizontally at least 1 foot into the pit.
- ii. The annular space between the lining and excavation wall shall be filled with crushed rock or gravel ranging from ¾ to 6 inches in diameter and free of fines, sand, clay or organic material. The maximum fines in the gravel shall be 2 percent by weight passing through a US Standard #10 mesh (2.0 millimeter) sieve.
- iii. Minimum width of annular space between lining and sidewall 12 inches.
- iv. Minimum thickness of reinforced perforated concrete liner 2 ½ inches.
- v. Minimum thickness of reinforced concrete top 6 inches.
- vi. Minimum depth of drain media in pit bottom 6 inches.
- vii. Minimum depth of cover over seepage pit top 6 inches.
- viii. A reinforced concrete top shall be provided.

(1) When the cover over the seepage pit top exceeds 6 inches, risers shall conform to Subsection R317-4-6.6.F for accessibility.

6.14. Alternative Systems.

A. System Types.

1. At-Grade.

2. Mounds.

3. Packed Bed Media.

- a. Intermittent Sand Filters.
- b. Recirculating Sand Filters.
- c. Recirculating Gravel Filters.
- d. Textile Filters.

**Comment [G46]:** This system type should be classified as a conventional system. In fact, this type of system is more likely to benefit from evaporation than any system currently classified as conventional. This is exactly the type of system we should be striving for.

e. Peat Filters.

4. Pressurized Absorption.

5. Sand Lined Trenches.

B. General Requirements.

1. Conformance to Applicable Requirements.

All requirements stated elsewhere in this rule for design, setbacks, construction and installation details, performance, repairs and abandonment shall apply unless stated differently for a given alternative system.

2. Sizing Criteria for Alternative Systems.

Absorption area shall be sized based on Table 5 or Table 6 except as specified in this section.

3. Design Criteria for Alternative Systems.

All alternative systems shall be designed by a person certified at Level 3 in accordance with Rule R317-11.

a. The designer shall submit details of all system components with the necessary calculations.

b. The designer shall provide to the local health department and to the owner operation and maintenance instructions which include the minimum inspection levels in Table 7 for the system.

4. Record on Deed of Ownership.

When an alternative system exists on a property, notification of the existence of that system shall be recorded on the deed of ownership for that property.

C. Design of Alternative Systems.

1. At-Grade Systems.

Absorption trenches and absorption beds may be used in at-grade systems. At-grade systems shall conform to the requirements applicable to absorption trenches and absorption beds, except for the following:

a. Horizontal setbacks in Table 2 are measured from edge of sidewall trench, with the exception of property lines, where the toe of the final cover shall be 5 feet or greater in separation distance to a property line.

b. Minimum number of observations ports provided within absorption area

2.

i. The ports shall be installed at the depth of the trench or bed.

c. Depth of absorption excavations below natural grade

0 to 10 inches.

d. Minimum cover over the absorption area

6 inches.

e. Maximum slope of natural ground surface

4%.

f. The maximum side slope for above ground fill shall be four (horizontal) to one (vertical)

25% slope.

g. Where finished contours are above the natural ground surface, the cover shall extend from the center of the wastewater system at the same general top elevation for a minimum of 10 feet in all directions beyond the limits of the absorption area perimeter, before beginning the side slope.

2. Mound Systems.

Mound systems shall conform to the following:

a. The design shall generally be based on the "Wisconsin Mound Soil Absorption System: Siting, Design and Construction Manual, January 2000" published by the University of Wisconsin-Madison Small-Scale Waste Management Project, with the following exceptions:

i. The minimum separation distance between the natural ground surface and the anticipated maximum ground water table

12 inches.

ii. Mound systems may be built over naturally existing soil types 1 through 4 or soils with a percolation rate between 1 and 60 minutes per inch provided the minimum depth of suitable soil is:

**Comment [G47]:** Pressurized absorption systems should not be classified as an "alternative system". They are easier and cheaper to install than a pump system with gravity distribution. And they provide better spread of effluent while using absorption area materials that are available at Home Depot and your local gravel pit. No rocket science here.

- (1) Between the natural ground surface and bedrock formations or unsuitable soils 36 inches; or,
- (2) Above soils which have a percolation rate faster than 1 minute per inch 24 inches.
- iii. The minimum depth of sand media over natural soil 12 inches.
- iv. The maximum slope of natural ground surface 25 %.
- v. The separation distances in Table 2 are measured from the toe of the final cover.
- vi. The effluent loading rate at the sand media to natural soil interface shall be calculated using Table 5 or Table 6.
- vii. The effluent entering a mound system shall be at levels at or below the defined parameters of non-domestic effluent.
- viii. The minimum thickness of aggregate media around the distribution pipes of the absorption system shall be the sum of 6 inches below the distribution pipe, the diameter of the distribution pipe and 2 inches above the distribution pipe or 10 inches, whichever is larger.
- ix. The cover may not be less than 6 inches in thickness and provide protection against erosion, frost, storm water infiltration and support vegetative growth and aeration of distribution cell.
- x. A minimum of three observation ports shall be located within the mound at each end and the center of the distribution cell.
  - (1) The ports shall be installed at the depth of the sand media.
- b. Mounds shall use pressure distribution. The Utah Pressure Distribution Systems guidance manual and Subsection R317-4-6.14.C.4 shall be used for design requirements.
  - i. See Appendix B for pump and control requirements.
- 3. Packed Bed Media Systems.
 

Packed bed media systems shall conform to the following:

  - i. Siting Conditions.
 

Packed bed media systems may be sited under the following conditions:

    - (1) The minimum separation distance between the natural ground surface and the anticipated maximum ground water table 12 inches.
    - (2) Packed bed media systems may be built over naturally existing soil types 1 through 5 or soils with a percolation rate between 1 and 120 minutes per inch provided the minimum depth of suitable soils is:
      - (a) Between the natural ground surface and bedrock formations or unsuitable soils 36 inches; or,
      - (b) Between the natural ground surface and bedrock formations or unsuitable soils 18 inches based on an evaluation of infiltration rate and hydrogeology from a professional geologist or engineer that is certified at the appropriate level to perform onsite wastewater system design and having sufficient experience in geotechnical engineering based on:
        - (i) Type, extent of fractures, presence of bedding planes, angle of dip;
        - (ii) Hydrogeology of surrounding area; and,
        - (iii) Cumulative effect of all existing and future systems within the area for any localized mounding or surfacing which may create a public health hazard or nuisance, description of methods used to determine infiltration rate and evaluations of surfacing or mounding conditions.
    - ~~(c) Above soils which have a percolation rate faster than 1 minute per inch 24 inches.~~
  - (3) Minimum separation distances in Table 2 are met, except for watercourses, lakes, ponds, reservoirs, non-culinary springs or wells, foundation drains, curtain drains or non-public culinary grouted wells (constructed as required by Title R309) which require a minimum of 50 feet of separation.

- (4) Wastewater Design Flows.
  - (a) For single-family dwellings the design shall be based on a minimum of 300 gallons per day for two bedrooms and 100 gallons per day for each additional bedroom.
  - (b) All other flow estimates shall be based on Table 3.
  - (c) Special design considerations shall be given for non-domestic effluent.
- ii. Effluent Distribution.  
Effluent shall be uniformly distributed over the filter media using pressure distribution.
- iii. Absorption System Requirements.  
Absorption systems shall conform to the following:
  - (1) The minimum required effective absorption area shall be calculated using Table 5 or Table 6 and may be reduced by 30 percent.
    - (a) The use of chambered trenches with a packed bed media system may not receive additional reductions as allowed in Subsection R317-4-6.13.F.1.b.
  - (2) For single-family dwellings the design shall be based on a minimum of 300 gallons per day for two bedrooms and 100 gallons per day for each additional bedroom.
    - (a) All other flow estimates shall be based on Table 3.
  - (3) The bottom of the absorption system shall have a vertical separation distance of at least 12 inches from the anticipated maximum ground water table.
  - (4) A minimum of two observation ports shall be provided within the absorption area.
- iv. Drip Irrigation.
  - (1) Drip irrigation absorption may be used for packed bed media system effluent dispersal based on type of soil and drip irrigation manufacturer's recommendations.
  - (2) Materials shall be specifically designed and manufactured for onsite wastewater applications.
  - (3) Non-absorption components shall be installed per Section R317-4-6 and Table 2.
- a. Intermittent Sand Filter Systems.
  - i. Media
    - (1) Minimum depth of sand media 24 inches.
  - ii. Maximum Application rate per day per square foot of media surface area 1.0 gallons.
  - iii. Maximum dose volume through any given orifice for each dosing 2 gallons
  - iv. Effluent entering an intermittent sand filter shall be at levels at or below the defined parameters of non-domestic effluent.
- b. Recirculating Sand Filter (RSF) Systems.
  - i. Media
    - (1) Minimum depth of washed sand 24 inches.
    - (2) Effective size millimeter. 1.5 to 2.5
    - (3) Uniformity Coefficient less than 3.0.
    - (4) Maximum fines passing through #50 Sieve 1 percent.
  - ii. Maximum Application rate per day per square foot of media surface area 5 gallons.
- c. Recirculating Gravel Filter (RGF) Systems.
  - i. Media.
    - (1) Minimum depth of washed gravel 36 inches.

- (2) Effective size millimeter. 1.5 to 5.0
- (3) Uniformity Coefficient less than 2.0.
- (4) Maximum passing through #16 Sieve 1 percent.
- ii. Maximum Application rate per day per square foot of media surface area 15 gallons.
- d. Textile Filter Systems.
  - i. Media shall be geotextile, AdvanTex, or an approved equal.
  - ii. Maximum Application rate per day per square foot of media surface area 30 gallons.
- e. Peat Filter Systems.
  - i. Minimum depth of peat media 24 inches.
  - ii. Maximum Application rate per day per square foot of media surface area 5 gallons.
- 4. Pressurized Absorption Systems.
  - a. Pressurized absorption systems may be permitted on any site meeting the requirements for an onsite wastewater system and conditions in this rule can be met.
  - b. Pressurized absorption should be considered when:
    - i. The flow from the dwelling or structure exceeds 3,000 gallons per day;
    - ii. When soils are a Type 1 or have a percolation rate faster than 5 minutes per inch; or,
    - iii. When soils are a Type 5 or have a percolation rate slower than 60 minutes per inch.
  - c. The Utah Pressure Distribution Systems guidance manual shall be used for design requirements, along with the following:
    - i. Dosing pumps, controls and alarms shall comply with Appendix B.
    - ii. Pressurized distribution piping.
      - (1) All pressure transport, manifold, lateral piping, and fittings shall meet Class 160 PVC 1120 pressure pipe as identified in ASTM Specification D2241. For pipe diameters of 1 inch or less, the minimum pressure rating is 200 pounds per square inch (psi). For pipe diameters greater than 1 inch, the minimum pressure rating is 160 psi.
      - (2) The ends of lateral piping shall be constructed with sweep elbows or an equivalent method to bring the end of the pipe to finished grade. The ends of the pipe shall be provided with treaded plugs, caps, or other devices acceptable to the regulatory authority to allow for access and flushing of the lateral.
- 5. Sand Lined Trench Systems.
 

Sand lined trench systems shall conform to the following:

  - a. Siting Conditions.
    - i. The minimum depth of suitable soil or saprolite between the sand media in trenches and the anticipated maximum ground water table 12 inches.
    - ii. Sand lined trench systems may be built over naturally existing:
      - (1) soil types 1 through 4; or,
      - (2) soils or saprolite with a percolation rate between 1 and 60 minutes per inch.
    - iii. The minimum depth of suitable soil or saprolite is:
      - (1) Between the sand media in trenches and bedrock formations or unsuitable soils 36 inches; or,
      - (2) Above soils or saprolite which have a percolation rate faster than 1 minute per inch 24 inches.

**Comment [G48]:** Pressurized absorption systems should not be classified as an "alternative system". They are easier and cheaper to install than a pump system with gravity distribution. And they provide better spread of effluent while using absorption area materials that are available at Home Depot and your local gravel pit. No rocket science here.

- b. Effluent Distribution.  
Effluent shall be uniformly distributed over the sand media using pressure distribution.
  - i. Design shall generally be based on the Pressure Distribution Systems Manual (UOWTP 2010).
- c. Absorption System Requirements.  
Sand lined trenches shall conform to the requirements applicable to absorption trenches except for the following:
  - i. Trenches in Suitable Soil.  
The minimum required effective absorption area shall be calculated using Table 5 or Table 6.
  - ii. Trenches in Saproliite.  
The minimum required effective absorption area shall be based on percolation rate using Table 5.
    - (1) This rate shall be determined by conducting percolation tests with a minimum soil swelling period between 24 to 30 hours.
  - iii. The use of chambered trenches with a sand media system may not receive additional reductions as allowed in Subsection R317-4-6.13.F.1.b.
  - iv. Width of absorption trench excavations 36 inches.
  - v. The entire trench sidewall shall be installed in natural ground. At-Grade system designs are not allowed.
  - vi. Minimum depth of sand media 24 inches.
  - vii. Sand lined trenches with drain media.
    - (1) Minimum depth of drain media under the pressure lateral distribution pipe 6 inches.
    - (2) Minimum depth of drain media over pressure lateral distribution pipe 2 inches.
    - (3) Minimum depth of soil cover or saprolite over drain media 6 inches.
  - viii. Sand lined trenches with Type A chambers.
    - (1) Minimum depth of soil cover or saprolite over chambers 12 inches.
  - ix. Minimum number of observation ports per trench 1.

## ***R317-4-7. Construction and Installation.***

### **7.1. System Installation.**

#### **A. Approved Plans.**

The installer may not deviate from the approved plans or conditions of the construction permit without the approval of the designer and the reviewing regulatory authority.

#### **~~B. Installation Restrictions.~~**

~~A regulatory authority may limit the time period or area in which a system can be installed to ensure that soil conditions, weather, groundwater, or other conditions do not adversely affect the reliability of the system.~~

#### **C. General Requirements.**

1. Prior to installation, all minimum setback distances shall be field verified.
2. All absorption areas shall be protected prior to and during site construction.
3. The regulatory authority may require a temporary barrier around the absorption area, including the replacement area for additional protection prior to and during any site construction. If necessary, a more permanent barrier may be required following construction.

4. All absorption excavations and piping shall be level within a tolerance of plus or minus 1 inch. The overall slope from effluent entry to terminus shall be no more than 4 inches per hundred feet.
5. Absorption system excavations shall be made such that the soil in the bottom and sides of the excavation is not compacted. Strict attention shall be given to the protection of the natural absorption properties of the soil.
6. Absorption systems may not be excavated when the soil is wet enough to smear or compact easily.
7. All smeared or compacted surfaces should be raked to a depth of 1 inch, and loose material removed before the absorption system components are placed in the excavation.
8. Open absorption system excavations shall be protected from surface runoff to prevent the entrance of silt and debris.
9. Absorption systems shall be backfilled with earth that is free from stones 10 inches or more in diameter.
10. Distribution pipes may not be crushed or misaligned during backfilling. When backfilling, the earth shall be mounded slightly above the surface of the ground to allow for settlement and prevent depressions for surface ponding of water.
11. Finished grading shall prevent ponding throughout the entire system area and promote surface water runoff.
12. Heavy wheeled equipment may not be driven in or over absorption systems prior to or during construction or backfilling.

D. Building and Effluent Sewer.

Pipe, pipe fittings, and similar materials comprising building and effluent sewers shall be composed of plastic, or other suitable material approved by the Division, and shall conform to the applicable standards as outlined in Table 4. The Division may recognize other applicable standards.

1. Each length of pipe shall be stamped or marked as required by the International Plumbing Code.
2. Where two different sizes or types of pipe are connected, a proper type of fitting or conversion adapter shall be used.
3. A cleanout with an extension to the surface of the ground, with screw lid or other cover, shall be installed in the building sewer if there is no building sewer cleanout within the foundation.
4. The sewers shall have watertight, root-proof joints and may not receive any ground water or surface runoff. They shall be laid in straight alignment and on a foundation of undisturbed earth or stabilized earth that is not subject to settling.

E. Tanks.

Tank installation shall conform to the following requirements:

1. All tanks shall be installed on a level, stable base that will not settle. The hole to receive the tank shall be large enough to permit the proper placement of the tank and backfill. Where ground water, rock or other undesirable protruding obstructions are encountered, the bottom of the hole shall be excavated an additional 6 inches, and backfilled with sand, crushed stone, or gravel to the proper grade. Backfill around and over the septic tank shall be placed in such a manner as to prevent undue strain or damage to the tank or connected pipes.

[2. Building sewer pipe going into the septic tank shall be backfilled with aggregate so that no settling or shearing of the pipe happens.](#)

F. Absorption Systems.

1. Cover shall be evenly graded over the entire absorption area.
2. Distribution and Drop Boxes.
  - a. The inlet and outlet piping shall be sealed watertight to the sidewalls of the box.
  - b. The box shall be provided with a means of access. The lid of the box shall be adequate to prevent entrance of water, dirt or other foreign material, but made removable for observation and maintenance of the system.



- c. The top of the box shall be at least 6 inches below finished grade.
- d. The box shall be installed on a level, stable base to ensure against tilting or settling, and to minimize movement from frost action.
- e. Unused "knock-out" holes in boxes shall be sealed watertight.
- 3. The solid and distribution pipes shall be bedded true to line and grade, uniformly and continuously supported by firm, stable material.
- 4. No cracked, weakened, modified or otherwise damaged chamber or bundled synthetic aggregate units shall be used in any installation.

#### H. Alternative Systems.

- 1. At-Grade and Mound Systems.
  - a. The site shall be cleared of surface vegetation, without removing soil, and scarified to an approximate depth of 6 inches. Any furrows resulting from the scarification shall be perpendicular to any slope on the site.
    - i. Rotary tilling is prohibited for scarification.
  - b. The system may not be installed in wet or moist soil conditions.
  - c. No equipment shall be driven over the scarified area.
  - d. The site shall be graded such that surface water drains away from the system and adjoining area.
- 2. Packed Bed Media, Pressurized Absorption, and Sand Lined Trench Systems.  
Installation practices shall follow the approved design.

### ***R317-4-8. Final Inspections.***

#### 8.1. Final Inspections.

The regulatory authority shall inspect the entire installation before backfilling to determine compliance with this rule. Some components or system types require additional testing or inspection methods as outlined in the following:

##### A. Tank Water Tightness Testing.

Each tank shall be tested for water tightness.

- 1. The tanks shall be filled 24 hours before the inspection to allow stabilization of the water level. Considering water absorption by the concrete, there may not be a change in the water level nor any water moving visibly into or out of the tank. Testing shall be supervised by the regulatory authority. Tanks exhibiting obvious defects or leaks may not be approved unless such deficiencies are repaired to the satisfaction of the regulatory authority.
  - a. The regulatory authority may allow two piece tanks, with the joint below the water level, to be backfilled up to 3 inches below the joint to provide adequate support to the seam of the tank.
- 2. If ground water elevations inhibit the ability to visibly inspect the exterior of the tank, the tanks may be tested by their ability to exclude water.

##### B. Distribution and Drop Boxes.

- 1. Distribution and drop boxes should be installed level and the flow distribution lines shall be checked by filling the boxes with water up to the outlets.

##### C. Deep Wall Trenches, Seepage Pits.

- 1. Verify the depth of the trench excavation.

##### D. At Grade and Mound Systems.

- 1. Verify the preparation of the original ground before the placement of fill.
- 2. Verify that the final cover meets requirements.

##### E. Alternative and Experimental Systems.

1. All additional inspections will be dictated by the complexity of the system and absorption system type as identified by the regulatory authority.

F. Final Approval.

Final approval shall be issued by the regulatory authority prior to operation of the system, and shall include an as-built drawing of the completed system.

### ***R317-4-9. Experimental Systems.***

9.1. Administrative Requirements.

- A. Where unusual conditions exist, experimental methods of onsite wastewater treatment and dispersal may be employed provided they are acceptable to the Division and to the local health department having jurisdiction.
- B. When considering proposals for experimental onsite wastewater systems, the Division may not be restricted by this rule provided that:
  1. The experimental system proposed is attempting to resolve an existing pollution or public health hazard, or when the experimental system proposal is for new construction, it has been predetermined that an acceptable back-up wastewater system will be installed in event of failure of the experiment.
  2. The proposal for an experimental onsite wastewater system shall be in the name of and bear the signature of the person who will own the system.
  3. The person proposing to utilize an experimental system has the responsibility to maintain, correct, or replace the system in event of failure of the experiment.
- C. When sufficient, successful experience is established with experimental onsite wastewater systems, the Division may designate them as approved alternative onsite wastewater systems. Following this approval of alternative onsite wastewater systems, the Division will adopt rules governing their use.

9.2. General Requirements.

- A. All experimental systems shall be designed, installed and operated under the following conditions:
  1. The ground water requirements shall be determined as described in Subsection R317-4-4.1.B.3.
  2. The local health department shall advise the owner of the system of the experimental status of that type of system. The advisory shall contain information concerning risk of failure, level of maintenance required, financial liability for repair, modification or replacement of a failed system and periodic monitoring requirements which are all specific to the type of system to be installed.
  3. The local health department and the homeowner shall be provided with sufficient design, installation and operating information to produce a successful, properly operating installation.
  4. The local health department is responsible for provision of, or oversight of an approved installation, inspection and maintenance and monitoring program for the systems. Such programs shall include approved procedures for complete periodic maintenance and monitoring of the systems.
  5. The local health department may impose more stringent design, installation, operating and monitoring conditions than those required by the Division.
  6. All failures, repairs or alterations shall be reported to the local health department. All repairs or alterations shall be approved by the local health department.
- B. When an experimental wastewater system exists on a property, notification of the existence of that system shall be recorded on the deed of ownership for that property.

### ***R317-4-10. Wastewater Holding Tanks. Administrative, Design and Installation.***

10.1. Administrative Requirements.

Requests for the use of wastewater holding tanks shall receive the written approval of the local health department prior to the installation of the holding tank and be administered under an annual operating permit.

A. Wastewater holding tanks are permitted only under the following conditions:

1. Where an absorption system for an existing dwelling has failed and installation of a replacement absorption system is not practicable;
2. As a temporary (not to exceed one year) wastewater system for a new dwelling until a connection is made to an approved sewage collection system;
3. A temporary (not to exceed one year) wastewater system that may include construction sites, labor camps, temporary mass gatherings, or emergency refuge sheltering; or,
4. For other essential and unusual situations where both the Division and the local health department having jurisdiction concur that the proposed holding tank will be designed, installed and maintained in a manner which provides long term protection of the waters of the state. Requests for the use of wastewater holding tanks in this instance shall receive the written approval of both agencies prior to the installation of such devices.

B. Except on those lots recorded and approved for wastewater holding tanks prior to May 21, 1984, wastewater holding tanks are not permitted for use in new housing subdivisions, or commercial, institutional, and recreational developments except in those instances where these devices are part of a specific watershed protection program acceptable to the Division and the local health department having jurisdiction.

**Comment [G49]:** Who makes this determination? What documentation is required to arrive at this conclusion?

**Comment [G50]:** Add "or,"

**Comment [G51]:** Add "or,"

10.2. General Requirements.

The design, site placement, installation, and maintenance of all wastewater holding tanks shall comply with the following:

- A. No wastewater holding tank shall be installed and used unless plans and specifications covering its design and construction have been submitted to and approved by the appropriate regulatory authority.
- B. A statement accompanying the application, that a contract with an approved pumper per Rule R317-550 will be obtained stating that the tank will be pumped out periodically at regular intervals or as needed, and contents will be disposed in an approved manner.
- C. If authorization is necessary for disposal of wastewater at certain facilities, evidence of such authorization must be submitted for review.

**Comment [G52]:** Who can prepare such plans and specifications?

10.3. Basic Plan Information Required.

Depending on the individual site and circumstances, or as determined by the regulatory authority, some or all of the following plan information may be required:

A. Applicant Information.

1. The name, current address, and telephone number of the applicant;
2. Complete address, legal description of the property, or both to be served by this onsite wastewater system.

B. A plot or site plan showing:

1. Direction of north,
2. Daily wastewater flow,
3. Location and liquid capacity of wastewater holding tank,
4. Source and location of water supply,
5. Location of water service line and building sewer, and
6. Location of streams, ditches, watercourses, ponds, etc., near property.

C. Plan detail of wastewater holding tank and high wastewater level warning device.

D. Relative elevations of:

1. Building floor drain,
2. Building sewer,
3. Invert of inlet for tank,

4. Lowest plumbing fixture or drain in building served, and
5. The maximum liquid level of the tank.

E. Statement indicating the maximum anticipated ground water table.

10.4. Construction.

- A. The tank shall be constructed of sound and durable material not subject to excessive corrosion and decay and designed to withstand hydrostatic and external loads. All wastewater holding tanks shall comply with the manufacturing materials and construction requirements specified for septic tanks.
- B. Construction of the tank shall be such as to assure water tightness and to prevent the entrance of rainwater, surface drainage or ground water.
- C. Tanks shall be provided with a maintenance access manhole at the ground surface or above and of at least 18 inches in diameter. Access covers shall have adequate handles and shall be designed and constructed in such a manner that they cannot pass through the access opening, and when closed will be child-proof and prevent entrance of surface water, dirt, or other foreign material, and seal the odorous gases in the tank.
- D. A high water warning device shall be installed on each tank to indicate when it is within 75 percent of being full. This device shall be either an audible or a visual alarm. If the latter, it shall be conspicuously mounted. All wiring and mechanical parts of such devices shall be corrosion resistant and all conduit passage ways through the tank top or walls shall be water and vapor tight.
- E. No overflow, vent, or other opening shall be provided in the tank other than those described above.
- F. The regulatory authority may require that wastewater holding tanks be filled with water and allowed to stand overnight to check for leaks. Tanks exhibiting obvious defects or leaks may not be approved unless such deficiencies are repaired to the satisfaction of the regulatory authority.
- G. The building sewer shall comply with this rule.
- H. Above ground holding tanks shall be clearly labeled as "Sewage".

10.5. Capacity.

The liquid capacity of the wastewater holding tank shall be based on wastewater flows for the type of dwelling or facility being served as identified in Table 3 and on the desired time period between each pumping.

- A. The minimum capacity of underground wastewater holding tanks shall be 1,000 gallons.

10.6. Location.

Wastewater holding tanks must be located:

- A. In an area readily accessible to the pump truck in any type of weather that is likely to occur during the period of use.
- B. In accordance with the requirements for septic tanks as specified in Table 2.
- C. Where it will not tend to float out of the ground due to a high ground water table or a saturated soil condition, since it will be empty or only partially full most of the time. In areas where the ground water table may be high enough to float the tank out of the ground when empty or partially full, adequate ground anchoring procedures shall be provided.

10.7. Management.

- A. Wastewater holding tanks shall be pumped periodically, at regular intervals or as needed, and the wastewater contents shall be disposed of in a manner and at a facility meeting the approval of the appropriate regulatory authority.
- B. Wastewater holding tanks for seasonal dwellings should be pumped out before each winter season to prevent freezing and possible rupture of the tank.
- C. A record of the liquid waste hauler, pumping dates, and amounts pumped shall be maintained and made available to the appropriate regulatory authorities upon request.
- D. Wastewater holding tanks shall be checked at frequent intervals by the owner or occupant and if leakage is detected it shall be immediately reported to the regulatory authority. Repairs or replacements shall be conducted under the direction of the regulatory authority.

E. Improper location, construction, operation, or maintenance of a particular holding tank may result in appropriate legal action against the owner by the regulatory authority having jurisdiction.

F. Each holding tank installed under this rule, shall be inspected upon renewal of the operating permit.

### ***R317-4-11. Operation & Maintenance of Systems.***

#### **11.1. Purpose.**

The purpose of this section is to diminish the possibility of onsite wastewater system failures by informing the owners and requiring periodic maintenance, servicing and monitoring. More complex systems will require a higher level of operation and maintenance.

#### **11.2. Conventional Systems.**

All conventional systems should be assessed at the following frequency:

- |   |                    |
|---|--------------------|
| A. Systems with daily flows between 1-3000 gallons    | every three years; |
| B. Systems with daily flows between 3001-5000 gallons | every two years;   |
| C. Systems with non-domestic wastewater flows         | yearly.            |

#### **11.3. Alternative Systems.**

A. Each alternative system shall be inspected as outlined in Table 7.1 and Table 7.2.

B. Each packed bed media system shall be sampled a minimum of every ~~six months~~ year as outlined in Table 7.3.

1. The grab sample shall be taken before discharge to an absorption system.
2. Effluent not meeting the standards of Table 7.3 shall be followed up with two successive weekly tests of the same type within a 30 day period from the first exceedance.
3. If two successive samples exceed the minimum standards, the system shall be deemed to be malfunctioning, and shall require further evaluation and a corrective action plan, see Subsection R317-4-3.11.
  - a. Effluent quality testing shall continue every two weeks until three successive samples are found to be in compliance.

#### **11.4. Tank Servicing.**

For recommended tank servicing see Appendix E.

#### **11.5. Distribution and Drop Box Maintenance.**

Distribution and drop boxes, if provided, should be inspected and cleaned periodically.

#### **11.6. Repair of a Malfunctioning System.**

If corrective action is required see Subsection R317-4-3.11.

### ***R317-4-12. Variance to Design Requirements.***

#### **12.1. Reasons for a Variance.**

An applicant may request a variance from onsite wastewater system design requirements, as specified in this section under the following circumstances:

- A. When site conditions do not allow a property owner to construct an onsite wastewater system so that the absorption bed or trench are separated from a dry wash, gully or gulch by a minimum distance of 50 feet as required in Table 2; or,
- B. When site conditions do not allow a property owner to construct an onsite wastewater system that complies with the slope and distance from slope requirements of Subsection R317-4-4.1.B.4 and Table 2.

#### **12.2. Standards.**

A variance will not be approved unless the applicant demonstrates that all of the following conditions are met:

- A. A wastewater system consistent with Rule R317-4 and local health department requirements cannot be constructed and a connection to a public or community-based sewerage system is not available. This determination will be made in consultation with the local health department.

**Comment [G53]:** Revise to read:  
"Circumstances Under Which a Variance May be Requested"

**Comment [G54]:** The way this is worded, once one of the two circumstances is identified as present, an applicant could then request a variance from said circumstance, plus any other code requirement he may choose to vary from.

Revise to read: "An applicant may request a variance only from any one or any combination of the following code requirements:"

- B. Wastewater from the proposed system will not contaminate ground water or surface water, and will not surface or move off site before it is adequately treated to protect public health and the environment.
- C. No slope will fail, and there will be no other landslide or structural failure if the system is constructed and operated as proposed, even if all properties in the vicinity are developed with onsite wastewater systems.
- D. Adjacent properties, including the current and reasonably anticipated uses of adjacent properties, will not be jeopardized if the proposed system is constructed and operated.

#### 12.3. Procedure for Requesting Variance.

- A. A variance request shall be submitted to the Executive Secretary and to the local health department.
- B. A variance request shall include the information and documentation described in Subsection R317-4-12.4.
- C. The Executive Secretary may, with the approval of the Board, appoint an advisory committee to consider variance requests and make recommendations to the Executive Secretary. Any such advisory committee shall include at least one representative from a local health department. The Executive Secretary may refer any variance request to the variance advisory committee.
- D. An applicant may request an advance determination about eligibility for a variance under Subsection R317-4-12.2 before the applicant may be reviewed by the Board as provided in Sections 19-5-112 and R317-9-3.
- E. A local health department may not issue an approval or an operating permit for an onsite wastewater system that does not comply with all pertinent design requirements unless a variance has been approved; however a local health department is not required to issue an approval or operating permit based on the Executive Secretary's or Board's approval of a variance.
- F. If approval of a variance is conditioned upon an applicant's commitment to record limiting conditions on the deed, the local health department may not issue an approval or operating permit for a system for which a variance has been approved until it confirms this condition has been fulfilled.
- G. If approval of a variance is conditioned upon the local health department's oversight of the applicant's continuing compliance with specified conditions, the local health department may not issue an approval or operating permit for a system for which a variance has been approved until the applicant and the local health department have executed a written agreement regarding reimbursement of costs or any fees associated with that oversight.
- H. All of the information required under Subsection R317-4-12.4, except the information required by Subsections R317-4-12.4.G and R317-4-12.4.H shall be submitted in a report by a professional engineer or a professional geologist that is certified at the appropriate level to perform onsite wastewater system design. An engineer or geologist who submits a report shall be licensed to practice in Utah and shall have sufficient experience and expertise to make the determinations in the report. Any such report shall include the engineer's or geologist's name and registration number, and a summary of qualifications. The report shall be imprinted with the engineer's or geologist's registration seal and signature.

#### 12.4. Application Requirements.

The variance application shall include all information and documentation necessary to ensure that the standards in Subsection R317-4-12.2 will be met, including, as appropriate:

- A. Information demonstrating that connection to a public or community-based sewerage system is not available, there is no other option for wastewater disposal, and site conditions prevent construction or use of an onsite wastewater system that is in compliance with applicable legal requirements.
- B. A detailed description of the proposed system, including engineering and reliability information, and information about its proposed location and a proposed replacement absorption bed or trench location, if necessary, to meet the requirements of Subsection R317-4-6.13.B.1.
- C. A detailed characterization of current hydrological and hydrogeological conditions at the proposed site, and characterization of hydrological and hydrogeological conditions predicted for the site after the proposed system is in operation. The report shall include the following information with all supporting information, field investigations and explorations, as applicable:
  - 1. A description of the tributary area;

2. Predictions, and supporting information, of ground water transport from the proposed system and of expected areas of ground water mounding if the system is operated as proposed in the application, including those in the tributary area;
  3. Predictions, and supporting information, of the impact of runoff on dispersal of wastewater;
  4. Information about the rate of runoff for a 100 year storm and the time of concentration for a given tributary area;
  5. Water surface profile throughout the area;
  6. Analysis, for nitrate, chloride, and coliform group bacteria, of samples from the closest groundwater down gradient from any existing absorption system.
- D. A stability analysis if the request is for a variance from slope requirements. The analysis shall include information about the geology of the site and surrounding area, soil exploration and testing.
- E. An operation, maintenance and troubleshooting plan to keep the installed system operating as described in the application.
- F. A contingency plan describing how a system that cannot meet the requirements of Subsection R317-4-12.2 will be replaced.
- G. A signed statement from the applicant acknowledging that he or she will, after a 30 day period for correction, be required to cease use and occupancy of buildings associated with an onsite wastewater system that fails to meet the standards in Subsection R317-4-12.2, and that use and occupancy will be allowed again only after standards are met.
- H. A proposal to record on the deed for the subject property a notice describing the system and an environmental easement, under the Environmental Institutional Control Act (Sections 19-10-101 through 19-10-108), mandating any pertinent maintenance requirements or limiting conditions.
- I. Documentation provided by the local health authority that the adjoining land owners have been notified and provided opportunity for comment of the proposed variance.
- 12.5. No Violation of Standards.
- No facility constructed pursuant to a variance shall violate the standards in Subsection R317-4-12.2.

### **R317-4-13. TABLES**

**TABLE 1 – MINIMUM LOT SIZE <sup>(A)</sup>**

Culinary Water Source	Soil Type				
	1	2	3	4	5 (c)
Public Water Supply	20000 sq.ft.	25,000 sq.ft.	30,000 sq ft	40,000 sq.ft.	(c)
Non-public Water Supply (b)	1.25 Acres	1.5 Acres	1.75 Acres	2 Acres	(c)

**SOIL TYPE KEY <sup>(d)</sup>**

Soil Type	Soil Texture (e)	Soil Structure	Percolation Rate (minutes per inch)
1	Course Sand, Sand, Loamy Course Sand, Loamy Sand	Single Grain	1-10
2	Fine Sand, Very Fine Sand, Loamy Fine Sand, Loamy Very Fine Sand	Single Grain	11-20
3	Course Sandy Loam, Sandy Loam	Prismatic, Blocky, Granular	21-40
4	Course Sandy Loam, Sandy Loam	Massive, Platy	41-60
	Fine Sandy Loam, Very Fine Sandy Loam, Loam, Silt Loam	Prismatic, Blocky, Granular	
5	Fine Sandy Loam, Very Fine Sandy Loam, Loam, Silt Loam,	Massive, Platy	61-120
	Sandy Clay Loam, Clay Loam, Silty Clay Loam	Massive	
	Sandy Clay Loam, Clay Loam, Silty Clay Loam, Sandy Clay, Clay, Silty Clay, Silt	Prismatic, Blocky, Granular	
6 (f)	Sandy Clay Loam, Clay Loam, Silty Clay Loam	Platy	>120
	Sandy Clay, Clay, Silty Clay, Silt	Massive, Platy	

#### **FOOTNOTES**

(a) Excluding public streets and alleys or other public rights-of-way, lands or any portion thereof abutting on, running through or within a building lot for a single-family dwelling. These minimum lot size requirements do not apply to building lots which have received final local health department approval prior to the adoption of this rule.

Lots which are part of subdivisions that have received final local health department approval prior to the adoption of this rule are only exempt from the minimum lot size requirements if the developer has and is proceeding with reasonable diligence. Notwithstanding this grandfather provision for approved lots, the minimum lot size requirements are applicable if compelling or countervailing public health interests would necessitate application of these more stringent requirements. The shape of the lot shall also be acceptable to the regulatory authority.

(b) See the separation requirements in Table 2.

(c) If type 5 soils are present, Method 1 shall be used for determining lot size.

(d) When there is a substantial discrepancy between the percolation rate and the soil classification, it shall be resolved to the satisfaction of the regulatory authority, or the soil type requiring the largest lot shall be used.

(e) See Appendix C for a more detailed description of the USDA soil classification system.

(f) These soils are unsuitable for any absorption system.



**TABLE 2 - MINIMUM SEPARATION DISTANCES IN FEET <sup>(A)</sup>**

Item Requiring Setback	From Building Sewers and Effluent Sewers	From Tanks (Septic, Pump and Others)	From Absorption Area and Replacement Area
Absorption and Replacement Areas	--	5	(b)
Public Culinary Water Sources	(c)	100 (c)	100 (c)
Individual or Nonpublic Culinary Water Sources (d)	25	50	100
Culinary Water Supply Line	(e)	10 (e)	10 (e)
Non-culinary Well or Spring	10	25	100
Lake, Pond, Reservoir (a)	10	25	100
Watercourse (live or ephemeral stream, river, subsurface drain, canal, storm water drainage systems, etc.)	--	25	100 (f)
Building Foundation Without foundation drain	--	5	5 (g)
With foundation drain	--	10	100 (h)
Curtain drains	10	10	100 (h)
Dry washes, gulches, and gullies	--	25	50
Swimming pool (below ground)	3	10	25
Dry wells, catch basins.		5	25
Down slopes that exceed 35 percent. (This includes all natural slopes or escarpments and any manmade cuts, retaining walls, or embankments.		10	50 (i)
Property line	5	5	5

**FOOTNOTES**

- (a) All distances are from edge to edge. Where surface waters are involved, the distance shall be measured from the high water line.
- (b) See Section R317-4-6 for setback requirements.
- (c) All distances shall comply with Rule R309-600.
- (d) Compliance with separation requirements does not guarantee acceptable water quality in every instance. Where geological or other conditions warrant, greater distances may be required by the regulatory authority.
- (e) If the water supply line is for a public water supply, the separation distance shall comply with the requirements of Rule R309-550. No culinary water service line shall pass through any portion of an absorption area.
- (f) Lining or enclosing watercourses with an acceptable impervious material may permit a reduction in the separation requirement. In situations where the bottom of a canal or watercourse is at a higher elevation than the ground in which the absorption system is to be installed, a reduction in the distance requirement may be justified, but each case shall be decided on its own merits by the regulatory authority.
- (g) Horizontal setback between a deep wall trench or seepage pit and a foundation of any building is at least 20 feet.
- (h) The regulatory authority may reduce the separation distance, if it can be shown that the effluent will not enter the drain, but each case must be decided on its own merits by the regulatory authority. In no case shall the regulatory authority grant approval for an absorption area to be closer than 20 feet.
- (i) This setback may be reduced if a reference line originating at the bottom of the distribution pipe, sloped at 35% below horizontal, will not daylight or intersect the ground surface.

**Comment [G55]:** Suggest 20 feet to allow construction equipment access around perimeter. In a properly designed septic system, leachate does not travel horizontally. Even for systems installed without design forethought, it is extremely rare to find an absorption area showing indication of wholesale migration of effluent along a horizontal plane. In summary, do not use this requirement as a hedge against faked soil profiling and perc test results. ENFORCE the soil observation pit and perc test rule!

**TABLE 3 - ESTIMATED FLOW RATES OF WASTEWATER <sup>(A)</sup>**

Type of Establishment	Gallons per Day
Airports a. per passenger b. per employee	3 15
Boarding and Rooming Houses a. for each resident boarder and employee per person b. additional for each nonresident boarders	50 per person 10 per person
Bowling Alleys (does not include food service)	85 per alley
Camps a. developed with flush toilets and showers b. developed with flush toilets c. developed with no flush toilets	30 per person 20 per person 5 per person
Churches, per person	5
Condominiums, Multiple Family Dwellings, or Apartments	150 per bedroom
Dentist's Office a. per chair b. per staff member	200 35
Doctor's Office a. per patient b. per staff member	10 35
Fairgrounds	1 per person
Fire Stations a. with full-time employees and food preparation b. with no full-time employees and no food preparation	70 per person 5 per person
Food Service Establishment (b) a. ordinary restaurants (not 24 hour service) b. 24 hour service c. single service customer utensils only d. or, per customer served (includes toilet and Kitchen wastes)	35 per seat 50 per seat 2 per customer 10
Gyms a. participant/staff member b. spectator	25 per person 4 per person
Hairdresser, per chair	65
Highway Rest Stops (improved, with restroom facilities)	5 per vehicle
Hospitals	250 per bed space
Hotels, Motels, and Resorts	125 per unit
Industrial Buildings (exclusive of industrial waste) a. with showers, per 8 hour shift b. with no showers, per 8 hour shift	35 per person 15 per person
Labor or Construction Camps	50 per person
Launderette	580 per washer
Mobile Home Parks	400 per unit
Movie Theaters a. auditorium	5 per seat

<b>Type of Establishment</b>	<b>Gallons per Day</b>
b. drive-in	10 per car space
Nursing Homes	200 per bed space
Office Buildings and Business Establishments (does not include food service) per eight hour shift	15 per employee
Picnic Parks (toilet wastes only)	5 per person
Recreational Vehicle Parks a. temporary or transient with no sewer connections b. temporary or transient with sewer connections	50 per space 125 per space
Recreational Vehicle Dump Station (per self-contained vehicle)	50
Schools a. boarding b. day, without cafeteria, gymnasiums or showers c. day, with cafeteria, but no gymnasiums and showers d. day, with cafeteria, gymnasium and showers	75 per person 15 per person 20 per person 25 per person
Service Stations (c) (per day, per pump)	250
Skating Rink, Dance Halls, Ski Areas, etc.	10 per person
Stores (Including Convenience Stores) a. per public toilet room b. per employee	500 11
Swimming Pools and Bathhouses (Using Maximum Bather Load)	10 per person
Taverns, Bars, Cocktail lounges (No Food Service)	20 per seat
Visitor Centers	5 per visitor

#### FOOTNOTES

- (a) When more than one use will occur, the multiple use shall be considered in determining total flow. Small industrial plants maintaining a cafeteria or showers and club houses or motels maintaining swimming pools or laundries are typical examples of multiple uses. Uses other than those listed above shall be considered in relation to established flows from known or similar installations.
- (b) No commercial food waste disposal unit shall be connected to an onsite wastewater system unless first approved by the regulatory authority.

**TABLE 4 – MINIMUM STANDARDS FOR BUILDING SEWER, EFFLUENT SEWER,  
AND DISTRIBUTION PIPE MATERIALS <sup>(A)</sup>**

<b>Acceptable Building Sewer and Effluent Pipe Materials</b>	
<b>Type of Pipe</b>	<b>Minimum Standard</b>
Acrylonitrile-Butadiene Styrene (ABS) Schedule 40	ASTM (b) D-2680 (c), D-2751, F-628
Polyvinyl Chloride (PVC) Schedule 40	ASTM D-2665, D-3033, D-3034
<b>Acceptable Distribution Pipe Materials</b>	
<b>Type of Pipe</b>	<b>Minimum Standard</b>
ABS Schedule 40	ASTM D-2661, D-2751
Polyethylene (PE), Smooth Wall	ASTM D-3350
PVC Schedule 40	ASTM D-2665, D-3033, D-3034
PVC	ASTM D-2729 (d)

**FOOTNOTES**

- (a) Each length of building sewer, effluent sewer, and distribution pipe shall be stamped or marked.
- (b) American Society for Testing and Materials.
- (c) For domestic wastewater only, free from industrial wastes.
- (d) Although perforated PVC, ASTM D-2729 is approved for absorption system application, the solid-wall version of this pipe is not approved for any application.

**TABLE 5 – MINIMUM HYDRAULIC LOADING RATES FOR PERCOLATION TESTING**

Percolation Rate (Minutes per Inch)	Absorption Systems Hydraulic Loading Rates (a) (gal/day/ft²) (c)(d)(e)	Absorption Beds and Mound Systems Hydraulic Loading Rates (b) (gal/day/ft²) (c)(d)(f)
1-10	0.90	0.45
11-20	0.70	0.35
21-30	0.60	0.3
31-40	0.55	0.27
41-50	0.50	0.25 (g)
51-60	0.45	0.22 (g)
61-90 (h)	0.40	(i)
91-120 (h)	0.35	(i)

**FOOTNOTES**

- (a) The following formula may be used in place of the values in this table:  $q=2.35$  divided by the square root of the percolation rate and then add 0.15 where  $q$  is the hydraulic loading rate.
- (b) The following formula may be used in place of the values in this table:  $q=1.2$  divided by the square root of the percolation rate and then add 0.08 where  $q$  is the hydraulic loading rate.
- (c) Minimum absorption area is equal to the actual or estimated wastewater flow in gallons per day (Table 3) divided by the hydraulic loading rate within the applicable percolation rate category.
- (d) For non-residential facilities, if a garbage grinder is not used the absorption area may be reduced by 10 percent (0.9 multiplier). If any automatic sequence washer is not used the absorption area may be reduced by 30 percent (0.7 multiplier). If both of these appliances are not used, the absorption area may be reduced by 40 percent (0.6 multiplier).
- (e) For non-residential facilities, a minimum of 150 square feet of trench bottom or sidewall absorption area shall be provided.
- (f) For non-residential facilities, a minimum of 300 square feet of absorption area shall be provided.
- (g) Not suitable for absorption beds.
- (h) Acceptable for alternative packed bed and sand media systems only.
- (i) Not suitable for absorption beds or mounds.

**TABLE 6 - MINIMUM HYDRAULIC LOADING RATES FOR SOIL CLASSIFICATION**

Texture	Structure	Absorption Systems Hydraulic Loading Rate (gal/ft²/day) (a)(b)(c)	Absorption Beds and Mound Systems Hydraulic Loading Rate (gal/ft²/day) (a)(b)(d)
Coarse sand, sand, loamy coarse sand, loamy sand	Single grain	0.9 (e)	0.45 (e)
Fine sand, very fine sand, loamy fine sand, loamy very fine sand	Single grain	0.7	0.35
Coarse sandy loam, sandy loam	Massive	0.45	0.22 (f)
	Platy	0.5	0.25 (f)
	Prismatic, blocky, granular	0.65	0.32

**Comment [G56]:** If “soil class” is going to include a numerical ID (ex: Class 1), then include those ID numbers in a new (first) column in this table, and in any other soil classification table herein.

<b>Texture</b>	<b>Structure</b>	<b>Absorption Systems Hydraulic Loading Rate (gal/ft<sup>2</sup>/day) (a)(b)(c)</b>	<b>Absorption Beds and Mound Systems Hydraulic Loading Rate (gal/ft<sup>2</sup>/day) (a)(b)(d)</b>
Fine sandy loam, very fine sandy loam	Massive	0.4	(g)
	Platy	0.35	(g)
	Prismatic, blocky, granular	0.5	0.25 (f)
Loam	Massive	0.4	(g)
	Platy	(e)	(g)
	Prismatic, blocky, granular	0.5	0.25 (f)
Silt loam	Massive	(e)	(g)
	Platy	(e)	(g)
	Prismatic, blocky, granular	0.45	0.22 (f)
Sandy clay loam, clay loam, silty clay loam	Massive	(e)(h)	(g)
	Platy	(i)	(i)
	Prismatic, blocky, granular	0.4 (e)(h)	(g)
Silt, silty clay, sandy clay, clay	Massive	(i)	(i)
	Platy	(i)	(i)
	Prismatic, blocky, granular	0.35 (e)(h)	(g)

**Comment [G56]:** If “soil class” is going to include a numerical ID (ex: Class 1), then include those ID numbers in a new (first) column in this table, and in any other soil classification table herein.

#### FOOTNOTES

- (a) Minimum absorption area is equal to the actual or estimated wastewater flow in gallons per day (Table 3) divided by the hydraulic loading rate within the applicable soil texture and structure category.
- (b) For non-single family dwellings, if a garbage grinder is not used the absorption area may be reduced by 10 percent (0.9 multiplier). If any automatic sequence washer is not used the absorption area may be reduced by 30 percent (0.7 multiplier). If both of these appliances are not used, the absorption area may be reduced by 40 percent (0.6 multiplier).
- (c) For non-single family dwellings, a minimum of 150 square feet of trench bottom or sidewall absorption area shall be provided.
- (d) For non-single family dwellings, a minimum of 300 square feet of absorption area shall be provided.
- (e) These soils are usually considered unsuitable for absorption systems, but may be suitable, depending upon the percentage and type of fines in coarse grained porous soils, and the percentage of sand and structure in fine grained soils. Percolation testing may be used for further evaluation.
- (f) Not suitable for absorption beds.
- (g) Not suitable for absorption beds or mounds.
- (h) These soils may be permissible for packed bed media absorption systems only.
- (i) These soils are unsuitable for any absorption system.

**TABLE 7 – INSPECTION FREQUENCY AND COMPONENTS, AND EFFLUENT PARAMETERS**

**7.1 – FREQUENCY <sup>(a)</sup>**

Type of System	Annual	Semi-annual
At-Grade (first 5 years only)	X	
Mound	X	
Packed Bed Media (b)		X
Pressurized Distribution	X	
Sand Lined Trench	X	
Holding Tank	X	
Experimental System		X

**Comment [G57]:** Remove pressure distribution from alternative systems list. Include with conventional systems

**FOOTNOTES**

(a) Or more frequently as directed by the regulatory authority.

(b) All packed bed media systems shall be sampled a minimum of every six months.

**7.2 – COMPONENTS <sup>(a)</sup>**

Type of System	Septic Tank and Other Tanks.	Distribution or Drop Boxes (if accessible)	Pumps, Float Settings, Control Panel	Pressure Laterals, Absorption Area
At-Grade	X	X	X	X
Mound	X		X	X
Packed Bed Media	X	X	X	X
Pressurized Distribution	X		X	X
Sand Lined Trench	X		X	X
Holding Tank (b)	X		X	
Experimental	X	X	X	X

**Comment [G58]:** Remove pressure distribution from alternative systems list. Include with conventional systems

**FOOTNOTES**

(a) Inspect other components as directed by the regulatory authority.

(b) Including pumping records.

**7.3 - EFFLUENT SAMPLING PARAMETERS**

Packed Bed Media System Routine Sampling Parameters Must sample Turbidity, or BOD <sub>5</sub> and TSS.			
Field Testing	Laboratory Testing		
Turbidity	BOD <sub>5</sub>	TSS	COD (a)
≤20 NTUs	≤25 mg/l	≤25 mg/l	≤75 mg/l

**FOOTNOTES**

(a) Chemical oxygen demand (COD) may be used in place of BOD<sub>5</sub>.

## **R317-4-14. APPENDICES**

### **APPENDIX A – SEPTIC TANK CONSTRUCTION.**

#### **1.1. Plans for Tanks Required.**

Plans for all septic tanks and underground holding tanks shall be submitted to the Division for approval. Such plans shall show all dimensions, capacities, reinforcing, and such other pertinent data as may be required. All tanks shall conform to the design drawing and shall be constructed under strict, controlled supervision by the manufacturer.

#### **A. Precast Reinforced Concrete Tanks.**

1. The walls and base of precast tanks shall be securely bonded together and the walls shall be of monolithic or keyed construction. The sidewalls and bottom of such tanks shall be at least 3 inches in thickness. The top shall have a minimum thickness of 4 inches. Such tanks shall have reinforcing of at least 6 inch x 6 inch No. 6, welded wire fabric, or equivalent. Exceptions to this reinforcing requirement may be considered by the Division based on an evaluation of acceptable structural engineering data submitted by the manufacturer. All concrete used in precast tanks shall be Class A, at least 4,000 pounds per square inch, and shall be vibrated or well-rodged to minimize honeycombing and to assure water tightness. Precast sections shall be set evenly in a full bed of sealant. If grout is used it shall consist of two parts plaster sand to one part cement with sufficient water added to make the grout flow under its own weight. Excessively mortared joints should be trimmed flush. The inside and outside of each mortar joint shall be sealed with a waterproof bituminous sealing compound.
2. For the purpose of early reuse of forms, the concrete may be steam cured. Other curing by means of water spraying or a membrane curing compound may be used and shall comply to best acceptable methods as outlined in "Guide to Curing Concrete, ACI308R-01," by American Concrete Institute, Farmington Hills, Michigan.

#### **B. Poured-In-Place Concrete Septic Tanks.**

The top of poured-in-place septic tanks with a liquid capacity of 1,000 to 1,250 gallons shall be a minimum of 4 inches thick, and reinforced with one 3/8 inch reinforcing rod per foot of length, or equivalent. The top of tanks with a liquid capacity of greater than 1,250 gallons shall be a minimum of 6 inches thick, and reinforced with 3/8 inch reinforcing rods 8 inches on centers both ways, or equivalent. The walls and floor shall be a minimum of 6 inches thick. The walls shall be reinforced with 3/8 inch reinforcing rods eight inches on centers both ways, or equivalent. Inspections by the regulatory authority may be required of the tank reinforcing steel before any concrete is poured. A 6 inch water stop shall be used at the wall-floor juncture to ensure water tightness. All concrete used in poured-in-place tanks shall be Class A, at least 4,000 pounds per square inch, and shall be vibrated or well-rodged to minimize honeycombing and to ensure water tightness. Curing of concrete shall comply with the requirements in Subsection R317-4-14 Appendix A1.2.

#### **C. Fiberglass Tanks.**

1. Fiberglass tanks shall comply with the criteria for acceptance established in the "Interim Guide Criteria For Glass-Fiber-Reinforced Polyester Septic Tanks", International Association of Plumbing and Mechanical Officials Z1000-2007. The identifying seal of the International Association of Plumbing and Mechanical Officials shall be permanently embossed in the fiberglass as evidence of compliance.
2. Inlet and outlet tees shall be attached to the tank by a rubber or synthetic rubber ring seal and compression plate, or in some other manner approved by the Division.
3. The tank shall be installed in accordance with the manufacturer's recommendations.

#### **D. Polyethylene Tanks.**

1. Polyethylene tanks shall comply with the criteria for acceptance established in "Prefabricated Septic Tanks and Wastewater Holding Tanks, Can3-B66-10" by the Canadian Standards Association, Ontario, Canada.
2. Inlet and outlet tees shall be attached to the tank by a rubber or synthetic rubber ring seal and compression plate, or in some other manner approved by the Division.
3. The tank shall be installed in accordance with the manufacturer's recommendations.

**Comment [G59]:** Consider using US equivalent



#### 1.2. Identifying Marks.

All prefabricated or precast tanks which are commercially manufactured shall be plainly, legibly, and permanently marked or stamped on the exterior at the outlet end and within 6 inches of the top of the wall, with the name and address or nationally registered trademark of the manufacturer and the liquid capacity of the tank in gallons. Both the inlet and outlet of all such tanks shall be plainly marked as IN or OUT, respectively.

#### 1.3. Inlets and Outlets.

Inlets and outlets of tanks or compartments thereof shall meet the minimum diameter requirements for building sewers.

A. Only one inlet or outlet is allowed, unless preauthorized by the regulatory authority.

B. Inlets and outlets shall be located on opposite ends of the tank.

1. The invert of flow line of the inlet shall be located at least 2 inches, above the invert of the outlet to allow for momentary rise in liquid level during discharge to the tank;
2. Approved tanks with offset inlets may be used when approved by the regulatory authority.

C. All inlets and outlets shall have a baffle or sanitary tee.

1. An inlet baffle or sanitary tee of wide sweep design shall be provided to divert the incoming wastewater downward. This baffle or tee is to penetrate at least 6 inches below the liquid level, but the penetration is not to be greater than that allowed for the outlet device;
2. For tanks with vertical sides, outlet baffles or sanitary tees shall extend below the liquid surface a distance equal to approximately 40 percent of the liquid depth. For horizontal cylindrical tanks and tanks of other shapes, that distance shall be reduced to approximately 35 percent of the liquid depth;
3. All baffles shall be constructed from sidewall to sidewall or shall be designed as a conduit;
4. All sanitary tees shall be permanently fastened in a vertical, rigid position.

D. Inlet and outlet pipe connections to the septic tank shall be sealed with a bonding compound that will adhere to the tank and pipes to form watertight connections, or watertight sealing rings;

E. Inlet and outlet devices may not include any design features preventing free venting of gases generated in the tank or absorption system back through the roof vent in the building plumbing system. The top of the baffles or sanitary tees shall extend at least 6 inches above the liquid level in order to provide scum storage, but no closer than 1 inch to the inside top of the tank;

#### 1.4. Liquid Depth of Tanks.

Liquid depth of tanks shall be at least 30 inches. Depth in excess of 72 inches may not be considered in calculating liquid volume required in Subsection R317-4-6.6.

#### 1.5. Burial Depth.

The maximum burial depth shall be stated on the plans submitted.

#### 1.6. Tank Compartments.

Septic tanks may be divided into compartments provided they meet the following:

A. The volume of the first compartment shall equal or exceed two-thirds of the total required septic tank volume;

B. No compartment shall have an inside horizontal dimension less than 24 inches;

C. Inlets and outlets shall be designed as specified for tanks, except that when a partition wall is used to form a multi-compartment tank, an opening in the partition may serve for flow between compartments provided the minimum dimension of the opening is 4 inches, the cross-sectional area is not less than that of a 6 inch diameter pipe (28.3 square inches), and the mid-point is below the liquid surface a distance approximately equal to 40 percent of the liquid depth of the tank.

#### 1.7. Scum Storage.

Scum storage volume shall consist of 15 percent or more of the required liquid capacity of the tank and shall be provided in the space between the liquid surface and the top of inlet and outlet devices.

1.8. Access to Tank Interior.

Adequate access to the tank shall be provided to facilitate inspection, servicing and maintenance, and shall have no structure or other obstruction placed over it and shall conform to the following requirements:

- A. Access to each compartment of the tank shall be provided through properly placed manhole openings not less than 18 inches in diameter, in minimum horizontal dimension or by means of an easily removable lid section.
- B. All access covers shall be designed and constructed in such a manner that they cannot pass through the access openings, and when closed will be child-proof and prevent entrance of surface water, dirt, or other foreign material, and seal the odorous gases in the tank. Concrete access covers for manhole openings shall have adequate handles.
- C. Access to inlet and outlet devices shall be provided through properly spaced openings not less than 12 inches in minimum horizontal dimension or by means of an easily removable lid section.

## APPENDIX B - PRESSURE DISTRIBUTION, PUMPS, CONTROLS, AND ALARMS.

### 1.1. Design.

The design shall generally be based on the “Utah Guidance for Performance, Application, Design, Operation & Maintenance Pressure Distribution Systems” December 2010 manual with the following exceptions:

- A. Design and equipment shall emphasize ease of maintenance, longevity, and reliability of components and shall be proven suitable by operational experience, test, or analysis, acceptable to the regulatory authority.
- B. Electrical disconnects shall be provided that are appropriate for the installation and shall have gas-tight junction boxes or splices. Electrical components used in onsite wastewater systems shall comply with applicable requirements of the State of Utah Electrical Code.
- C. All components shall be constructed and installed to facilitate ease of service without having to alter any other part.

### 1.2. Pumps, Controls, and Alarms.

Prior to final approval for operation, all pumps, controls and related apparatus shall be field tested and found to operate as designed.

- A. When duplex pump system is designed, controls shall be provided that an alarm will signal when one of the pumps malfunctions.
- B. Where multiple pumps are operated in series, controls shall be installed to prevent the operation of a pump or pumps preceding a station that experiences a high level alarm event.
- C. Controls shall be capable of controlling all functions incorporated or required in the design of the system.
  - 1. The control panel for all pressure distribution systems shall include a pump run-time hour meter and a pump event counter or other acceptable flow measurement method.
  - 2. The control panel shall be installed within sight of the access risers.
  - 3. Supporting hydraulic calculations and pump curve analysis shall be submitted to the regulatory authority with the design.

**Comment [G60]:** How is this documented at the end of the day? Will regulatory authority inspection notes suffice (public record), or will contractor or designer certify in writing?

**Comment [G61]:** Add “If reasonably feasible,”

**Comment [G62]:** “Should”

**Comment [G63]:** Add: “At a minimum, these calculations shall include the following:

system curve development accounting for all system head losses; absorption bed piping design including manifold sizing, lateral sizing, lateral orifice sizing, spacing, and location; lateral orifice flow and flow velocity; residual pressure; force main sizing; force main drain back volume (if applicable); dose volume; pump tank volume allocation including emergency storage volume; alarm volume; working volume; dead storage; alarm depth settings; pump curve and pump operating point stated as flow at total dynamic head;

## APPENDIX C - SOIL EXPLORATION PITS, SOIL LOGS, SOIL EVALUATIONS.

### 1.1. Soil Exploration Pit Construction.

Soil conditions shall be obtained from soil exploration pit(s) dug to a depth of 10 feet in the absorption area, or to the ground water table if it is shallower than 10 feet below ground surface. In the event that absorption system excavations will be deeper than 6 feet, soil exploration pits shall extend to a depth of at least 4 feet below the bottom of the proposed absorption system excavation.

**Comment [G64]:** Add: "but in no case less than 4 feet below existing grade"

A. Soil exploration pits shall be constructed in a manner to reduce potential for physical injury. One end of each pit should be sloped gently or "stair-stepped" to permit easy entry if necessary.

### 1.2. Soil Logs.

A. The soil log shall contain the following information:

1. A signed statement certifying that the logs were evaluated and recorded in accordance with this rule;
2. The name(s) of the individual(s) conducting the tests, as per Rule R317-11;
3. The location of the property;
4. The location of the soil exploration pit on the property;
5. The date of the log.

6. A description and depths of the soil horizons throughout the soil exploration pit to include:

- a. Soil texture and structure using the USDA system of classification;
- b. Estimated volume percentage of coarse fragments;
  - i. "Gravel" means a rock fragment from 0.1 inches to 3 inches in diameter.
  - ii. "Cobble" means rock fragment from 3 inches to 10 inches in diameter.
  - iii. "Stone" means a rock fragment greater than 10 inches in diameter.

c. The presence and abundance of mottling;

- i. Mottles are 'few' when less than 2 percent of the exposed surface is occupied by mottles;
- ii. Mottles are "common" when from 2 percent to 20 percent of the exposed surface is occupied by mottles; and
- iii. Mottles are "many" when more than 20 percent of the exposed surface is occupied by mottles.

d. Depth to groundwater or bedrock if encountered and maximum anticipated groundwater table.

e. Other pertinent information.

**Comment [G65]:** Add "estimated"

**Comment [G66]:** Delete "anticipated"

### 1.3. Soil Evaluation.

Soils shall be evaluated using the United States Department of Agriculture (USDA) Soil Texture Classification method.

**Comment [G67]:** Add: "including, but not necessarily limited to, depth to remnant topsoil layer(s), roots, buried trash or debris, utility lines"

A. The soil horizon with the lowest loading rate shall be used in calculating the required absorption area.

## APPENDIX D - PERCOLATION METHOD.

### 1.1. Percolation Test Requirements.

Percolation tests shall be completed by an individual certified per Rule R317-11 and shall be conducted in accordance with the instructions in this appendix.

A. When percolation tests are conducted, such tests shall be conducted at points and elevations selected as typical of the area in which the absorption system will be located.

B. Percolation test results shall be submitted on a signed "Percolation Test Certificate". The test certificate shall contain the following:

1. A signed statement certifying that the tests were conducted in accordance with this rule;
2. The name(s) of the individual(s) conducting the tests, as per Rule R317-11;
3. The location of the property;
4. The location of the percolation tests on the property
5. The depth to the bottom of the percolation test hole from the existing grade.
6. The final stabilized percolation rate of each test in minutes per inch;
7. The date of the tests.
8. Other pertinent information

C. Percolation tests shall be conducted at the owner's expense and in accordance with the following:

1. Conditions Prohibited for Test Holes.

Percolation tests may not be conducted in test holes which extend into ground water, bedrock, or frozen ground. Where shrink-swell clays, fissured soil formations, or saprolite is encountered, tests shall be made under the direction of the regulatory authority.

2. Soil Exploration Pit Prerequisite to Percolation Tests.

Since the appropriate percolation test depth depends on the soil conditions at a specific site, the percolation test shall be conducted only after the soil exploration pit has been dug and examined for suitable and porous strata and ground water table information. Percolation test results should be related to the soil conditions found.

Comment [G68]: Redundant; delete

3. Test Holes to Commence in Specially Prepared Excavations.

All percolation test holes should commence in specially prepared larger excavations (preferably made with a backhoe) of sufficient size which extend to a depth approximately 6 inches above the strata to be tested.

4. Type, Depth, and Dimensions of Test Holes.

Test holes shall be dug or bored, preferably with hand tools such as shovels or augers, etc., and shall have horizontal dimensions ranging from 4 to 18 inches (preferably 8 to 12 inches). The vertical sides shall be at least 12 inches deep, terminating in the soil at an elevation 6 inches below the bottom of the proposed onsite wastewater system. In testing individual soil strata for deep wall trenches and seepage pits, the percolation test hole shall be located entirely within the strata to be tested, if possible.

Comment [G69]: Add "approximately"

5. Preparation of Percolation Test Hole.

Carefully remove any smeared soil surfaces and to provide an open, natural soil interface into which water may percolate. Remove all loose soil from the bottom of the hole. Add 2 to 3 inches of clean pea gravel to protect the bottom from scouring or sealing with sediment when water is added. Caving or sloughing in some test holes can be prevented by placing in the test hole a wire cylinder or perforated pipe surrounded by clean pea gravel.

Comment [G70]: Make gravel optional. There are other ways to prevent scouring...leave this up to the test technician.

6. Saturation and Swelling of the Soil.

It is important to distinguish between saturation and swelling. Saturation means that the void spaces between soil particles are full of water. This can be accomplished in a relatively short period of time. Swelling is a soil volume increase caused by intrusion of water into the individual soil particles. This is a slow process, especially in clay-type soil, and is the reason for requiring a prolonged swelling period.

7. Placing Water in Test Holes.

Water should be placed carefully into the test holes by means of a small diameter siphon hose or other suitable method to prevent washing down the side of the hole.

8. Percolation Rate Measurement, General.

Necessary equipment should consist of a tape measure (with at least 1/16 inch calibration) or float gauge and a time piece or other suitable equipment. All measurements shall be made from a fixed reference point near the top of the test hole to the surface of the water.

9. Percolation Test Procedure.

The hole shall be carefully filled with clear water and a minimum depth of 12 inches shall be maintained above the gravel for at least a four hour period by refilling whenever necessary. Water remaining in the hole after four hours may not be removed. Immediately following the saturation period, the soil shall be allowed to swell not less than 16 hours or more than 30 hours. Immediately following the soil swelling period, the percolation rate measurements shall be made as follows:

- a. Any soil which has sloughed into the hole shall be removed and water shall be adjusted to 6 inches over the gravel.
- b. Thereupon, from the fixed reference point, the water level shall be measured and recorded at approximately 30 minute intervals for a period of four hours unless two successive water level drops do not vary more than 1/16 of an inch and indicate that an approximate stabilized rate has been obtained.
  - i. If 6 inches of water seeps away in less than 15 minutes, a shorter time interval of 5 minutes between measurements may be used;
  - ii. If 6 inches of water seeps away in less than 30 minutes, a shorter time interval of 15 minutes between measurements may be used;
- c. The hole shall be filled with 6 inches of clear water above the gravel after each time interval.
- d. In no case shall the water depth exceed 6 inches above the gravel.
- e. The final water level drop shall be used to calculate the percolation rate.
  - i. If no stabilized rate is achieved, the smallest drop shall be used to make this calculation.
- f. Precautions shall be taken to prohibit water or soil from freezing during the test procedure.

10. Test Procedure for Type 1 and Type 2 Soils.

The hole shall be carefully filled with clear water to a minimum depth of 12 inches over the gravel and the time for this amount of water to seep away shall be determined. The procedure shall be repeated and if the water from the second filling of the hole at least 12 inches above the gravel seeps away in 10 minutes or less, the test may proceed immediately as follows:

- a. Water shall be added to a point not more than 6 inches above the gravel.
- b. Thereupon, from the fixed reference point, water levels shall be measured at 10 minute intervals for a period of one hour.
  - i. If 6 inches of water seeps away in less than 10 minutes, a shorter time interval of 5 minutes between measurements may be used;
- c. The hole shall be filled with 6 inches of clear water above the gravel after each time interval.
- d. In no case shall the water depth exceed 6 inches above the gravel.
- e. The final water level drop shall be used to calculate the percolation rate.
  - i. If no stabilized rate is achieved, the smallest drop shall be used to make this calculation.

11. Calculation of Percolation Rate.

The percolation rate is equal to the time elapsed in minutes for the water column to drop, divided by the distance the water dropped in inches and fractions thereof.

12. Using Percolation Rate to Determine Absorption Area.

The minimum or slowest percolation rate shall be used in calculating the required absorption area.

**Comment [G71]:** Change to 1/8. We're kidding ourselves at 1/16...virtually impossible to consistently read this.

**Comment [G72]:** Suggest 9 inches; easier to read with no meaningful difference in head or pre-saturation effect;

**Comment [G73]:** Suggest 9 inches; also revise below as applicable;

**Comment [G74]:**

**Comment [G75]:**

**Comment [G76]:**

## **APPENDIX E - TANK OPERATION AND MAINTENANCE.**

### **1.1. Maintenance of Septic Tanks.**

- A. Septic tanks shall be emptied before too much sludge or scum is allowed to accumulate and seriously reduce the tank volume settling depth. If either the settled solids or floating scum layer accumulate too close to the bottom of the outlet baffle or bottom of the sanitary tee pipe in the tank, solid particles will overflow into the absorption system and eventually clog the soil and ruin its absorption capacity.
- B. A septic tank which receives normal loading should be inspected at yearly intervals to determine if it needs emptying. Although there are wide differences in the rate that sludge and scum accumulate in tanks, a septic tank for a private residence will generally require emptying every three to five years. Actual measurement of scum and sludge accumulation is the only sure way to determine when a tank needs to be emptied. Experience for a particular system may indicate the desirability of longer or shorter intervals between inspections.
- C. The tank should be completely emptied if either the bottom of the floating scum mat is within 3 inches of the bottom of the outlet device (baffle or tee) or the sludge level has built up to approximately 12 inches from the bottom of the outlet device (baffle or tee), or the scum and sludge layers together equal 40% or more of the tank volume. All three wastewater components, scum, sludge, and liquid waste shall be removed. Tanks should not be washed or disinfected after emptying.
- D. If multiple tanks or tanks with multiple compartments are provided, care should be taken to ensure that each tank or compartment is inspected and emptied.
- E. Septic tank wastes contain disease causing organisms and shall be disposed of only in areas and in a manner that is acceptable to local health authorities and consistent with State rules.
- F. Immediate replacement of damaged inlet or outlet fittings in the septic tank is essential for effective operation of the system.
- G. Effluent screens or filters.  
Remove the filter in a manner that prevents solids from passing to the absorption system. Wash the filter over the inlet side of septic tank. Replace the cleaned filter back into the outlet "tee".
- H. When the tank is empty, the interior surfaces of the tank should be inspected for leaks or cracks using a strong light.
- I. A written record of all maintenance of the septic tank and absorption system should be kept by the owner of that system.
- J. The functional operation of septic tanks is not improved by the addition of yeasts, disinfectants, additives or other chemicals; therefore, use of these materials is not recommended.
- K. The advice of your regulatory authority should be sought before chemicals arising from a hobby or home industry or other unusual activities are discharged into a septic tank system.
- L. Economy in the use of water helps prevent overloading of a septic tank system that could shorten its life and necessitate expensive repairs. The plumbing fixtures in the building should be checked regularly to repair any leaks which can add substantial amounts of water to the system. Industrial wastes and other liquids that may adversely affect the operation of the onsite wastewater system should not be discharged into such a system. Paper towels, facial tissue, disinfectant wipes, newspaper, wrapping paper, disposable diapers, sanitary napkins, coffee grounds, rags, sticks, and similar materials should also be excluded from the septic tank since they do not readily decompose and can lead to clogging of both the plumbing and the absorption system.

### **1.2. Maintenance of Other Tanks.**

- A. Other Tanks.  
Any measurable amount of sludge or scum present in other tanks should be removed.
- B. If a filter is present, it should be rinsed and cleaned over the opening of the septic tank.